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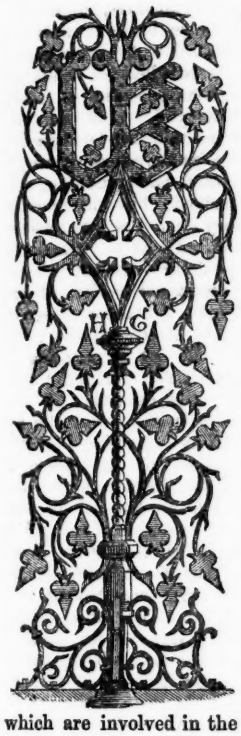
Cooking-Apparatus and Kitchen Ranges in "the Exhibition."



E have already devoted an article to the subject of heating and cooking apparatus generally, and have noticed therein certain foreign arrangements and contrivances, as well as some of the kitchen-ranges of English manufacture in "the Exhibition."* In a later article we have continued the subject of heating apparatus, including that of contrivances for the consumption of smoke, and others applicable to chimneys, and designed for the prevention of smoke-nuisance.† It is not necessary that we should now revert at much length to the important considerations which are involved in the study of the best form of cooking-apparatus. We need merely re-urge that the question is not only for the upper and middle classes, but is most important to the poor, or all those who are restricted to narrow space in places of residenee, and require the maximum of nourishment from, and some degree of relish in, what they are able to purchase and prepare as food; the latter quality in what is eaten, being we believe of some importance to the former, and itself, if realized, calculated to diminish appeals to other temporary gratification, long recognized by philanthropists and magistrates as the teeming source in our nation, of misery and crime. We should be prepared to carry further our argument in favour of the practice of French cookery, whilst recognizing all that may be said in favour of a joint of good roast meat; because the foreign system does not ignore the natural taste for variety, the exigencies of most households, and fact as to what is purchasable by many of our industrious artisans. We therefore deem it essential for a cooking stove or range, whilst capable of *roasting* in the best manner, to be furnished with appliances in great number and variety for other culinary operations; and the problem as left by our first article, we believe to be, the production of an arrangement or forms of apparatus having all the advantages of the "American," "Emigrant's," or like form of stove, but less objectionable on the score of heating the kitchen, if not more comfortable in appearance when adapted to the general living-room of the working-man. A boiler which may afford a constant supply of hot-water, and never be in danger of getting burnt,—or burst, in time of frost, like some of those of Lancashire houses, not long ago,—and ample convenience for drying and ironing clothes, ought to be considered in such a grate, as well as economy in fuel, smoke consumption and conduction, and facility of cleansing; several of which latter objects, however, at once, are attained by proper contrivance of the grate and smoke-ducts, and of the large flue. The system of cookery is one of the points for consideration when designing such a grate. The sort of fuel to be used is another; and that subject deserves now all the attention that can be given to it. Those who are accustomed only to coal as a combustible, scarcely know how large the question is; and thanks are due to a writer in the *Times*, who in treating of the fuel in the Exhibition, has incidentally spoken of the probability of using carbonic-oxide gas. The question of adaptation to a combustible, would resolve itself into the construction of special forms of grate, or of forms which would be capable of modification readily. Several of the grates in the Exhibition indeed are put forward as having this latter point in view. The convenience of charcoal for many of the culinary operations, especially where space is limited, or where much fire is not wanted, deserves consideration by many of those who never think of it. The manufacturers of cooking apparatus in Paris, sell a species of grate, *coquille*, of fire-clay, with a light front of bars,—a mere flat upright shell, which can be carried in the hand like a small carpet bag, and holding a very small quantity of fuel,—and which can be set anywhere, with a joint and a reflecting screen or Dutch-oven in front of it. An eminent member of the British diplomatic service tells us, that when he was in the East, he extemporized with three flower-pots, an arrangement of cooking-stove which not only saved himself and his family from the sort of starvation that would have been their lot, but enabled him to set before his friends many well-appreciated and very toothsome dinners. The helpless condition of our soldiers in campaign, and many recent inventions which we have had scarcely time to look for in the class (11) of the Exhibition which adjoins that (10) of Building Contrivances and that (31) which we are now examining, would supply the further arguments, and the indication of means, for the pursuit of the subject by manufacturers beyond the limitation of the description of apparatus which we find in the divisions last named of the South-Kensington building.

There about forty exhibitors of cooking apparatus in Class 31, British Division of the Exhibition. Messrs. Ritchie, Watson, & Co., of Glasgow, are amongst those who exhibit the portable stoves "on the American principle—Uncle Sam by name," which we have several times mentioned. They are made in three sizes, with or without boilers, with a fire (which may be used for roasting, or inclosed by doors), and a shelf for the meat in front, together, at one end, and with an oven towards the opposite end; and with the hot plate, having four apertures and gratings, on the top. The same manufacturers exhibit a small portable farm-boiler, with fire-clay linings, which may made set on wheels or without. Messrs. Smith & Wellstood, of Bonnybridge, Glasgow, exhibit similar articles. Their portable stove costs from three guineas upwards. It is made with a shelf at one side, on which a tin-vessel may be placed, and wherefrom a supply of boiling-water may be obtained. A London agent, Mr. J. H. Riddell, speaks of contrivances such as we have described, as providing, at a cost of fuel of one shilling per week, the cooking—including roasting, baking, boiling, and steaming, for a large family, besides affording a plentiful supply of hot-water, and keeping a warm-bath ready night and day; bnt surely that must be not quoting the price of coal in London. In comparing prices of ranges of whatever kind, it is necessary to observe that some of them include kettles and much other apparatus. Many of the large ranges, which we shall examine shortly, would be better without the polished steel hinges and other ornamentation, and not considering that this adds ten or fifteen pounds to the price. The agent we have named, shows in his prospectus a not unsuggestive form of stove called "the Queen," which, made for office, parlour, or bedroom, may be converted into a cooking-stove (as there is space on the top, for two boilers or kettles), and by turning up the hearth-plate against the bars, into a close-stove, which would burn without danger when required to be left. The fire-place is lined with fire-brick; and the price of one of the sizes is 1*l.* 16*s.*; to which is to be added 2*s.* 6*d.* for man's time in fixing. The "Empress" cooking-stove of Messrs. Smith & Wellstood has the top of the stove fitted with a *movable* "concentrating hood" or cover, for enclosing all the cooking utensils and preventing the evil to which we have adverted, the overheating of the kitchen, as well as circulation of steam in the kitchen, besides enclosing heat from the hot-plate and concentrating it upon the cooking-vessels in use on the stove, so as to render necessary a smaller consumption of fuel. These stoves are constructed with four oven doors, which have an inside lining and a space between, in order that the heat may not pass through the metal and be radiated from the outer surface. The inside linings are made with a reflecting surface, under the idea that the heat will be thereby thrown back to the centre of the oven. Messrs. Smith & Wellstood, however, forget the distinction between radiation and reflection, as they might have found it explained in any good book on chemistry and the laws of heat. Mr. Hunt remarks that while lamp-black will give a radiating-power of 100, polished iron will only give 15. We were careful, in our last article, to distinguish between reflected fire-light and radiated heat. Mr. W. N. Nicholson, of Newark, is also an exhibitor of a plain form of cooking-stove of the portable kind above described, as of several of his kitchen-ranges and grates, similar to those which have been used in some of the model lodging-houses. We should be glad of any information as to the wear of those grates and of the ovens attached to them; for, some of these in the Exhibition seem wanting in that *extra*-strength which has been shown to be quite essential in the class of dwellings in question. We call to mind, also, that one form of grate first used in one of the model lodging-houses on an extensive scale, was found objectionable. If we remember rightly, the coal would not burn well in it. Perhaps, however, that grate was not one of Mr. Nicholson's; or his may have replaced the faulty one. Several manufacturers have formed their oven doors of iron, enamelled white. There is some reason to doubt whether the enamel would be permanent. The case is not that of a cooking utensil, such as a frying-pan, which is always kept moist when exposed to the fire-heat. We recommend all to whom economy is an object, to inform themselves of the character of the articles manufactured at Newark, which are but poorly represented in the Exhibition. Mr. W. Addis exhibits Cundy's Economic Cottager's Cooking Stove, besides the Brick-Oven Winding-cheek Semi-close Range. Actual use, and that extending over some lengthened period, is, unfortunately for architects, the only satisfactory test of inventions; whilst evidence of any kind is difficult to be gathered; but this grate seems cheap and convenient, and it occupies small space. Like those which are best known as English, it is intended to fit into a chimney-recess. It includes a large oven below the fire, with door opening as a flap, and serving as a rest in removing the bread or other contents, and a boiler and hot-plate; the grate, by raising the top flap and letting down another in front, being converted from a close to an open fire. The price of this grate is three guineas for the 24 inches size, and four guineas for the 30 inches size, prices which seem to us not low, comparing the convenience of this form of range with that of the French stoves. In the winding-cheek grate, there is the recognition of the advantage of roasting before a fire, combined with the means of using a surface above it as hot-plate, which is characteristic of many of the ranges in the Exhibition.

We have drawn our readers' attention to the question of French cookery for reasons sufficiently explained; and to forms of apparatus of foreign manufacture, some of them not shown in the Exhibition, because of their convenience in any system

* See page 629, *ante*. † See page 670, *ante*.

wherein variety of food is considered, as well as of their economy of space, and what we believe to be their lowness of price. Since our first article, we have found that an agency has been established in the Strand for the supply of the "*Cuisinières*" of Messrs. Beuret, H. Goddard, Desmarest, & Cie., from the manufactory in the Departement de l'Aisne. These are not the cheap tile-covered ranges of *fourneaux* that we spoke of, but the forms of stove with oven, roasting-grate, and hot-plate, which are made of iron. The ease with which the rapidity of cooking can be regulated, is mentioned by the London agency as one advantage of of the apparatus; and in addition to other advantages that we have spoken of, it is said experience shows that the cheapest description of coal is the best. The fire requires no stirring. This foreign contrivance is better in several respects than the English. The price of the smallest size, 19 inches in length, with boiler and one oven, and the hot-plate and roasting-grate, is 2*l.* 18s., which is of course more than the price in France.

Besides the French stoves that we have mentioned or described, there are some in other divisions of the Exhibition on the same principle, or approachable on three, or the four, sides. In the Swiss Division, there is one, exhibited by J. A. Lehmann, of Sargans, St. Gall, which is very complete, and suited to the preparation of a large dinner; though it is of no great size. In the Swedish Division, cooking stoves are exhibited by more than one manufacturer of Stockholm. In a stove by J. & C. D. Bolinder, (in which there are two ovens, a roasting-grate at the end, facing two ways, and room for four pans,) the hot-plate, which measures 2 feet 2 inches by 2 feet, can be *all* taken off in pieces, an immense advantage. The price is 4*l.* The introduction of an oven in one of the stoves, in the lower part, where, as in some of the stoves standing on four legs, there would be waste of space, is an advantage. One stove provides a small oven with dripping-pan, and a hot-plate with two apertures for pans or broiling, heated by a small fire, in the space of 1 foot 11 inches by 1 foot, by 1 foot, for the sum of 2*l.*; but the same article could probably be made for less. A stove which is circular on plan, is exhibited by A. Moberg, of the same capital. The circle is 2 feet 3 inches in diameter, and the height of the stove is about 1 foot 3 inches. The fire-place is very small; and the top is constructed so that it may be turned round, and each vessel upon the plate, or each *fourneau*, exposed successively to the fire. A hot-water boiler can be affixed to the side of the stove, but this is an extra. The stove alone would be 3*l.* 14s. 6d. In the Norwegian Division, cooking-stoves are exhibited by Wingaard & Bouilly, of Bergen, and the Factory of Laxevaag of the same place. They correspond in principle with stoves that we have described. One of them resembles two pots; and the fire, which is at one end, has a flue, which, by means of a damper, can be made to conduct the heat to one or both of the pots as required. In the Austrian Division of the Machinery Annex, we find a stove by Leopold Feivel, of Pesth, Hungary, which is different in form to anything we have described. Besides the hot-plate, with fire beneath it, at the end, and ovens, there is a peculiar structure enclosing a washing-copper and hot-closets, added to the ordinary arrangement of the stove, rising to about 5 feet from the floor, and treated as an ornamental feature, as by use of curved lines in its plan, and arranging the top as a miniature flower-garden, where also celery may be grown. The copper is shut in, and ventilates into the flue. There are three fire-places, four ovens, fitted with apparatus for baking, a boiler besides the copper, and numerous compartments and fittings of different kinds. But the price asked for the whole, is 100*l.* The enamelled ware cooking-vessels, in the north-western transept, manufactured by Pleischl of Vienna, deserve the notice of those who take interest in the condition of classes of the people with regard to whom much of the matter preceding, has been written. With these vessels there is a cleverly arranged field-cooking service, measuring less than 1 foot in height by 11 inches diameter, and containing a multitude of pots, pans, plates, ladles, castors and gridirons.

When our first article was written, we had, from circumstances to which we have too often had to allude, missed seeing the General Foundry Company's Table Range for the centre of a kitchen, which is precisely similar to one that was supplied for the kitchen of Mr. Kühn's *restaurant* in Hanover-street, Regent-street, and briefly mentioned by us when placed there. It is a complete specimen, and of the largest size, of the French arrangement, with somewhat greater importance than usual given to the space for roasting in front of the fire, which last is at one end. The hot-plate is in area, about 40 superficial feet: all this is available for cooking-purposes; and below it there are two large roasting and two baking ovens, the open fire before alluded to, a boiler capable of keeping 500 gallons of water at boiling-point, and another boiler which will supply steam for very large requirements. The manufacturers say that the consumption of fuel does not exceed 1¼ cwt. per day when the whole of the processes—roasting in the ovens and before the fire, baking, grilling, boiling, steaming, and stewing, are in full operation; and Mr. Kühn reports that he could cook with this range alone, from 500 to 1,000 dinners "*à la carte*" in one day, each dinner having three or four courses; whilst of soups and plain joints only, he could provide dinners for four thousand persons in a day. It will roast, says the same authority, twenty-four joints every two hours, and will cook one hundred cutlets perfectly in five minutes. Joints of 112 lb. weight can be cooked. The consumption of coal, he continues, is but one-third of that in a series of apparatus which he had previously used, and which had been inefficient. Our recollection of what we heard at Mr. Kühn's would have led us to a different idea as to the fuel; and the kitchen was certainly very hot. But, the testimony may be regarded as in favour of *cuisinières* and stoves on a smaller scale, slightly modified as they might be to suit completely, English tastes. Somewhat in this direction referred to, is the arrangement of Richards' Ventilating Circular-Front Cooking Stove, which is exhibited by the Coalbrookdale Company, and has a projection of about two feet from the chimney jambs, a semi-circle on plan, into the kitchen. The fireplace, of slight depth, is in the middle of the front, covered at top by its portion of the hot-plate, backed by fire-lump, and provided in the front with different ingenious modifications of the front and bottom bars to adapt the fire for use, including or not including roasting, or for merely warming the kitchen cheerfully. There is a ventilated oven for "roasting" or baking on one side of the fire, and a pastry oven or hot-closet on the other; whilst the hot-plate is provided as usual, with circular openings in which pans may be placed. There is a boiler at the back. The ash-pit is enclosed, and provided with a flue, to prevent escape of dust into the room. The convenience of the semi-circular form for allowing access to the ovens and hot-plate, whilst meat is before the fire; and the ease with which the lumps and other wearing parts can be removed; are claimed as advantages in this grate. The price of the apparatus as shown would be 30*l.*; but a range having all the essentials we have described, might be made for 18*l.* The same company exhibit a good grate of a more usual kind, containing an open fire, with a hot-plate (which is hinged to lift up, where over the fire, and has a circular aperture into which a gridiron is made to fit,) and with two large ovens round which smoke-ducts circulate, to heat the ovens and the plate. Fire-clay back and sides to the grate, a boiler, a damper and soot-door to each of the three flues which join into the general one, a plate-shelf of rails, a sliding-door in the iron-ceiling of the recess and range, and the trough and Archimedean screw feeding-apparatus of Young's smokeless grate described in our preceding articles, comprise the other features of the range, which may be had for 40*l.* in the most complete form, and with the steamers and dripping-pans, or for 20*l.* in the simplest form, as described, without jamb and back-linings and the movable apparatus.

Desiring to make our notice of this department as complete as may be, we shall be forced once more to return to it.

QUESTION OF FRESCO *v.* OIL, ENCAUSTIC, MAROUFLAGE, AND ENAMEL.

Since the evident failure of our first attempts at the restoration of the art of fresco-painting in the mural pictures of the Palace of Westminster, a question has arisen, whether fresco, in its purely traditional character, may not be advantageously superseded by some other method. The French, who preceded us in the attempt to re-establish the grand system of mural decoration so successfully developed by the Italian masters of the Mediæval and Renaissance periods, soon began to perceive that the ancient process, in their hands, did not produce the effects required; that it did not appear to harmonize with the high mechanical finish of other branches of modern art; and, worst of all, it did not appear likely, under modern treatment, that it would prove a permanent method. The ancient processes were probably, when practised in a manner to ensure success, too laborious to suit the modern artist. They belonged to a time when the wage of an artist was but a few degrees above that of a day labourer; when he had no social position to maintain; when a lump of bread-and-cheese and an onion was a sufficient meal. On looking to the past history of the art, it will be seen that when these conditions gave place to others belonging to a more advanced period of social development,—when the Raffaelles, the Cellinis, the Bramantes, the Buonarottis, of art began to receive large rewards for their works, and the appreciation of artistic genius began to be a fashion, even when not a feeling, among princes, the laborious processes of fresco became less and less employed. It is true that the brothers Carracci, at a somewhat later period, revived the art for a time, by the excessive energy with which they prosecuted their vocation, and founded a remarkable school; but the practice was no longer the ordinary one. The vast number of Italian churches, decorated with those masterly works in fresco that still delight the enthusiastic connoisseur, belong to an earlier period. From Giotto to Perugino we have a brilliant series of great masters in the art of fresco painting; the highest development of the art culminating in the works of Raffaelle himself. But after that epoch the decline, with the exception of the works of the Carracci, is rapid. Raffaelle (as we observed when lately speaking of the rapid decay of the frescoes of the House of Lords) had determined to abandon it for the superior facilities afforded by the oil process. After that period, a greater number of wall paintings and ceiling paintings were executed in oil than in fresco; many of the finest things of the class in the Ducal Palace at Venice having been produced by that method. The later ceiling paintings of Rome, Florence, Genoa, were nearly all in oil. The decorations of the Luxembourg Palace at Paris were executed by Rubens in oil: his celebrated ceiling at Whitehall was in oil; and the English painted ceilings and staircases of the eighteenth century, some of which were very creditable works, though of course in the meretricious fashion of the day, were invariably in oil. The works in this material, when the walls or ceilings were properly prepared and defended from the encroachments of damp from the exterior, lasted exceedingly well. The old staircase at Montague House, afterwards the British Museum, though heavy and dark in style, proved itself a sound kind of work, inasmuch as durability is concerned; showing but few signs of decay when the old mansion was recently pulled down to make room for one of Sir Robert Smirke's compositions of the Ionic order. The ceiling of the church of Little Stanmore, better known as Whitchurch, adjoining Cannons, once the residence of a Duke of Buckingham, before the decay of the family, was decorated by the French artist Laguerre, who executed so many works of the kind in England during the last century; and at the same church there is a "Nativity" over the altar by Belluchi; the works of both artists being, at the present time, in nearly as good preservation as when Handel must have occasionally bestowed a glance on them, as he invented voluntaries upon the organ, and composed a special service for the favoured congregation of this little village church, during his long residence at Cannon Park.

The restorations now going on at the church of St. Roch, in Paris, have attracted the attention of artists to the paintings in that church, executed during the first half of the last century; which, among other examples of eighteenth century art, are leading connoisseurs towards a better appreciation of the works of that period; which, however low the range of their actual merits may be, have long been rated even beneath their actual worth. The paintings of the two lesser cupolas of St. Roch were executed by the nearly-forgotten painter Pierre. Those in the other parts of the church are by Lemercier, and the portico was painted by Robert de Cotte. The projected new paintings on the dome of the transept, which had gradually fallen into a dilapidated state, and has just been restored, have been confided to Mr. Lehman, and those of the other renovated parts of the church to the brothers Balze. It is said that the new paintings will all be executed by a new method termed Marouflage, which may be described in the following manner:—The basis consists of a strong canvas rendered impermeable by an infallible process, greatly improved in some respects by Mr. Haro: the canvas, as at present prepared, presenting an excellent surface for painting, and thoroughly saving the work from injury by the chances of damp. This can-

vas, when properly prepared, is, in the first instance, sufficiently elastic to adapt itself with equal facility to a concave or convex surface as to a flat one; no difficulty being found in fitting it to coved ceilings with the greatest smoothness and accuracy. A very important advantage of the style is that, while *in situ*, it has the appearance of being the real surface of the solid wall. It can yet, in case of necessity, be peeled off and removed, without the slightest injury, to another situation. If some of the charmingly *naive* productions of Giotto, Masaccio, or Ghirlandajo, that have already perished, had been executed by the marouflage process, they might have been saved by a timely removal from the frequently unsound walls upon which they were wasted; and would now be preserved as invaluable monuments of a past epoch of art in our public museums and galleries. The fine ceiling, painted by Ingres, at the Parisian Hôtel de Ville, representing the apotheosis of Napoleon; and also the paintings executed by Delacroix, at the Church of St. Sulpice, in the Faubourg St. Germain, are executed on this material, which can be used either for distemper colours in the manner of fresco, or for oil. A still more recent improvement in this process has been effected by Mr. Paul Balze, which effectually removes a few trifling inconveniences which were found in actual practice to occur in the marouflage system. The brothers Balze are themselves the painters of those fine copies from the works of Raffaelle which adorn the walls of St. Geneviève.

The encaustic system has also been essayed with success by the leading French artists. This method of painting with a wax medium, the colours mixed with wax being incorporated with the stone or plaster by means of heat, applied in the form of cauterium or heated iron, has been found exceedingly durable; and, without having the undesirable gloss of oil, is found to possess a kind of subdued brightness—sometimes termed by decorators an egg-shell gloss, which brings out the intensity of the colours much more satisfactorily than the fresco process.

The encaustic method, in a modernized form, was the one adopted by Delaroche in the hemicycle de l'École des Beaux Arts, which still remains, on the whole, the most successful piece of modern wall-painting. Of the soundness and permanency of the process there is little doubt. Not only do modern works executed on stone walls, several years ago, by this method, exhibit no signs of decay; but we have the testimony of ancient authors to the fact, that the "Battle of Marathon," executed in encaustic at Athens by Polynotus, in the portico of the Agora, which afterwards, in consequence of this painting, became known as the Pœcile, or painted portico, lasted in good preservation for 900 years; a fact to which attention is called by Count Raczynski in his interesting and instructive work. Encaustic ought, therefore, to be essayed by our own artists. We should like to see Mr. Maclise try his hand upon this material before permanently deciding upon the glass medium, which is open to chemical objections that we may discuss on some future occasion.

There is yet another modern method, also developed by the enterprising industry of French artists, and which has the advantage of being equally applicable to external or internal decorations. This process is that of monumental enamel; which is a method of applying the principles of enamel-painting to works of colossal dimensions. Pictures produced by this process possess all the brilliancy of mosaic; combined, of course, with much more freedom of treatment, and a durability to which there appears to be no limit. Two large paintings, to be executed by this new process, have been already commenced by Mr. Paul Balze, for the Church of St. Augustine, at the end of the Boulevard Malesherbes. The process, though requiring more time than encaustic or fresco, may yet be executed far more rapidly than mosaic. This style, for ecclesiastical decorations, could be used very effectively in conjunction with mosaic; the decorative portions of the work being executed by the mosaic process in a bold and marked style, showing distinctly the joinings of the enamelled tesseræ; while the more flowing, free style of the enamel pictures should produce the effect of an entirely distinct *modus operandi*; yet, at the same time, producing an effect of harmony by, to the eye of the spectator, a similar material, though treated in a different manner, and having in both forms a remarkable appearance of solidity and durability. The distinct marking of the joints of the tesseræ, in ornamental work, produces an agreeable impression of system and regularity, the value of which was well understood by ancient decorators; who, when mosaic of that class was too expensive for the purpose required, executed the subject in ordinary painting, and then traced upon it a series of marks, to simulate mosaic, with a deep brown colour, which was laid on with a sharply-pointed brush. Several examples of this imitative mosaic have been, from time to time, discovered at Pompeii, and preserved in the Museo Borbonico. The agreeable effect in decorative work of a certain character by this reticulation of slight dark lines is analogous to that produced by *stipple* in miniature painting. It produces an effect of general evenness which cannot be obtained except by these processes, or others of a similar kind.

While, however, we are thus discussing the merits of methods hitherto untried by English artists, it may be as well to refer to that kind of mixed fresco and distemper which was the process generally used in the mural decoration of Greek and Roman houses. The true fresco process, as applied to pictures, does not appear to have been understood by the artists of ancient Greece or Rome. They prepared coloured panels in their walls by a fresco process, in which colour was applied to successive coatings of the plaster work while wet; thus producing panels, or spaces of a self-colour, or waved in imitation of marble, which were so ornamental, and at the same time so solidly done, that whole slabs were frequently removed from one building to another, on account of their great beauty. Such panels, in walls, were also prepared by this fresco process, with a ground colour, intended to receive a picture, which was painted upon it in distemper of a superior kind, which is often erroneously termed fresco, and which has, in fact, proved itself fully as durable in some of the paintings of Pompeii; but it is extremely doubtful whether any of the wall-paintings of the baths of Titus, at Rome, or those of the houses of Pompeii, or of the recently-discovered paintings of the crypt of St. Clemente at Rome, executed about the time of Constantine, were actually painted in fresco. It was the Italian artists of Mediæval epochs who developed the art of fresco as applied to the picture itself as well as to the wall or ground intended to receive it; and with them the art has probably died out, never to be revived with anything like the same amount of mechanical success.

Nevertheless it must be confessed that we ought not to measure the probable success of modern fresco by our own abortive efforts. The Continental fresco works, both French and German, have been, to a certain extent, successful; and in Germany many of the leading artists appear determined not at present to desert that style for any other. They are still actively engaged on works produced by that method, not merely in national or civic halls, and in churches, but even in railway stations. In the principal railway station at Munich, Mr. Echter, a well-known pupil of Kaulbach, has just executed two fresco subjects of more than usually ambitious character. The two subjects were selected as being appropriate to the railway system. They are "Steam" and the "Electric Telegraph." The power of steam, in the form of a hugh Titan, has been yoked to a magnificent car, in which a female figure of commanding aspect, representing Intellect, holds the reins and goad. The harnessed Titan, his impatient breath gushing from mouth and nostril like jets of hissing steam, plunges madly forward; and at his approach crowds of old-world prejudices, habits, and customs are scattered in every direction. Prim sentinels at frontiers, and dogmatic officers of custom-dues, scamper out of the way of the careering monster, Steam; while a whole cloud of stamped and signed and countersigned official papers are carried off in a whirlwind of vapour. Notifications, permits, passports, are also vanishing into space as the chariot of Intellect is carried impetuously forward by the subdued powers of the huge Titan, Steam.[2] The allegory which represents the Electric Telegraph is more complicated still, and would require some good training in a school of German philosophy to enable an ordinary spectator to make it all out. The interpretation of the main features, however, which are strikingly depicted, is easy enough after a little consideration; though they might puzzle the usual company of an English railway station pretty considerably. The genius of the Telegraph is represented by a majestic female figure rising from the earth, whose golden hair spreads into wide radiations like electric wires, which might be carrying forth Thought from its seat in the train, the outstretched arms pointing to the far-distant horizon. This figure is merely a symbolical personification of the electric power of the telegraph; the working principle being much more elaborately expressed in another feature of the allegory. A kneeling nymph is seen whispering into the ear of a child floating in the air. The child is, simultaneously, whispering the message into the ear of another floating child holding the hand of the first; a third receives it from the second; and so on through a long line of gracefully floating children, in a thousand playful attitudes, linked hand to hand, each transmitting the message to the other at the same moment; while, at the end of the line,—faint and slender in the far distance,—another nymph receives the message from the last child, and inscribes it on a scroll which has been prepared for its reception. It must be admitted that all this is ingenious, though rather complicated. The execution is, however, so good that even those who will not accept the composition as a clear allegory will admire it as a good picture.

We have described a few recent Continental works in fresco to show that there is no reason at present for abandoning its resuscitation in England as a hopeless task.

OPEN COMPETITIONS IN SPAIN.

Our advertising columns have shown that designs are being sought from English architects and others for the buildings to be erected in Madrid for the Hispano-American Exhibition, and that a plan of the ground, &c., may be seen at the Spanish Consulate. Some of the conditions will interest others besides those who may intend to compete, as they serve to show something of the position of architects in Spain.

"The situation appointed for the buildings is outside the gate of Alcala.

One or more buildings are to be designed, with ground-floor and upper gallery. 4,000 mètres to be devoted to agricultural objects, 4,000 to the fine arts, and 8,000 to industry; forming total, 16,000 superficial mètres, to be laid out in such form that the said building or buildings may be hereafter adapted to such other uses as the public services may require.

The utmost care must be taken in the arrangement, proportion, beauty, &c., as well as in the most convenient access and circulation in all directions, as well regarding the interior of the building as the streets, walks, &c., which surround it.

The building to be designed as standing on a stone base above the foundations, to be built of brick, glazed or not, in its frontages; the framing to be of iron or other industrial combinations; the light to be principally received from above; and the whole to have the architectural character proper to the class of building.

The interior decorations will be very simple; for, as it will be principally formed by the regular placing of the objects exhibited, the author may limit himself to the preparation of the spaces to be occupied by platforms, counters, cases, &c. With regard to the exterior, the designer will endeavour to exhibit the advancement made in this branch of industry; and which, avoiding the perishable works in plaster, employs terra-cotta bricks of different class and form, glazed tiles, stuccoes, stones from different provinces, and permanent colours.

Plans will be admitted from Spaniards and foreigners, provided they are presented at the office of the principal secretary of the Exhibition Committee before the expiration of the term of five months from July 17th, 1862.

After the expiration of five months the committee will forward the plans to the Royal Academy of San Fernando, in order that they may pronounce their opinion on each after examination; form a comparative judgment, bearing in mind the degree of economy and estimated cost; and afterwards return them provided with these requisitions to the said committee.

The author of the adopted plan being a Spanish architect, or any other who shall have fulfilled the prescriptions of Article 96 * of the Law of Public Instruction, relating to the manner of temporarily authorizing foreigners to exercise their respective professions in the Spanish dominions, will obtain, if agreeable to himself, the official direction of the works, whether these are performed by con-

* "Article 96.—The Government shall be able, on just grounds, and after having heard the Royal Council of Public Instruction, to grant a temporary authorization for the exercise of their respective professions in the Spanish dominions to such foreign graduates as shall solicit the same, always provided they furnish proof of the validity of their professional titles or diplomas of their having exercised their profession for six years, and effected payment of the amount of fees, which shall not exceed that which is payable for similar diplomas in our own establishments."

tract or by a company; an annual salary of 30,000 reals (300*l.*) whilst the works continue, and 1 per cent. on the capital employed, for plans, estimates, and reports, according to the scale of charges now in force; payment to be made at the expiration of each quarter, or on effecting liquidations.

If he should not consider it suitable to accept the official direction of the work under the said terms, he will receive a premium of 60,000 reals, the plans and other documents forming the design to become the property of the committee.

The author of the plan which, in conformity with the reports of the Royal Academy, shall present in the judgment of the committee the greatest advantages for the special object in question, next after the plan selected, will obtain a supplementary premium of 20,000 reals (200*l.*).

The plans, &c., to become the property of the committee.

In order not to lose any useful idea contained in any plan, even when not considered acceptable in its entirety, the committee shall be able to grant indemnification or recompense to the amount of 10,000 reals in favour of such plans: the same to become the property of the committee. Such plans as do not receive any of the premiums above mentioned will be returned in conformity with the receipts which have been issued accordingly."

Hotel for the Minister of Public Works in Madrid. — Another important competition is opened in Spain, but is not addressed, as far as we can learn, to foreign architects, as in the previous case. Designs are wanted for a building for the Minister of Public Works, and for various connected purposes, public instruction, a library, &c. The building is to be a rectangle, 103½ mètres in length, and 60 mètres wide. The style of the building is to be that which the *architect considers best adapted to the intended* object. Four months are given from the 4th of September to prepare the designs, which will be submitted for examination to the "Academy of the three Fine Arts of St. Fernando." The author of the selected design, if he carry out the work, is to receive a commission of *ten per cent.*: the author of the second-best design, 40,000 reals (400*l*).

THE SAILORS' HOME,

WELL STREET, NEAR THE LONDON DOCKS.

To those who have been accustomed to the peculiarities of other districts of the metropolis, and have not wandered eastward, such a journey is one of interest; but, upon the whole, the investigation will not be attended with much pleasure; for in the crowded locality which is near the Pool and the great docks, which are thronged with shipping, there are neighbourhoods and scenes of depravity to be met with which are disgraceful to any Christian land. Here vice does not assume any disguise, but walks in the broad daylight. There are numerous snares openly laid for reckless sailors: there are crimps; there are dishonest lodging-house keepers, avaricious Jews and others, who, when "Jack" has come off a long voyage, and has not yet received his pay, will advance money on interest: there are dealers who are ready to supply goods on credit at four times their proper price; and there are, besides, others who, when the ships have been paid off, undertake to be the sailors' bankers, and cheat them at every opportunity. Every step the sailor takes is watched; and when, as is too often the case, he has, as he says, "taken too much on board," he is frequently robbed of his last shilling and shamefully ill treated. In fact, when the seaman arrives in the port of this metropolis he has dangers to encounter which are little less formidable than the rocks, shoals, and stormy water with which he has had to contend at sea. A recent visit to the eastern regions shows us that, although the common lodging-houses which are under the charge of the police are improved, there are still conditions existing which are so bad that it is scarcely possible to overcolour them. There are dens in this neighbourhood which make feeling hearts shudder. Let us look to one of the brighter spots in the midst of them—the Home offered to sailors.

The Sailors' Home and the Asylum owe their origin mainly to Captain C. Gambier, R.N.; the late Captain R. J. Elliot, R.N.; and Lieut. Robert Justice. In the winter of 1827, those gentlemen were struck by the necessity which existed for some provision for starving, half-naked, homeless, and friendless sailors, and the want of some decent lodging-house to which they might resort when in port, where their hard-earned wages would be safe from plunder; and what they did not require for themselves might be put into a savings bank, or safely transmitted to their relations: a place, too, where they might be in the way of providing themselves with further employment without the ruinous intervention of crimps, whose business it chiefly is to deceive and rob them. Just at this time the Brunswick Theatre fell; and the situation of this building, near the London Docks, was considered so very desirable for the purpose they had in view, that Captains Gambier and Elliot, with the assistance of a few friends, but chiefly with their own money, purchased the ground, and the old materials for the purpose of building on that spot such a lodging-house as they contemplated for the exclusive use of seamen, and also an asylum for those who were destitute. The first stone of the Sailors' Home was laid on the 10th of June, 1830. The building went on with many interruptions, amidst much opposition from those who were interested in perpetuating the vice and misery of sailors; and it was not till the 1st of May, 1835, that it was opened for the reception of 100 men. From time to time fresh additions were made, and increased accommodation provided, as funds could be procured. There is now room for about 330 inmates; and so great is the demand for the excellent accommodation which is to be found here, that it has become necessary to extend the premises, and the directors have therefore determined to take steps for this purpose when the lease of some back premises expire in June next. In order to enable the directors to carry out this useful and necessary work, they appeal to a nation which is so much dependent on the exertions of our mariners for support. Surely they will not appeal in vain.

On entering the building, on the ground-floor we find a spacious waiting-hall, fitted with seats. Here, at the time, were a large number of sailors of different nations, who were assembled for the purpose of being engaged, and on other business. There is a shipping-office, in which ship owners and masters have an opportunity of selecting their crews, and sailors can choose their ships and the particular voyage on which they wish to engage. Here they sign the ships' articles, and receive allotment notes of part of their wages for the support of their families while they are absent. In the discharging office the crews of British ships, on their return from foreign voyages, receive their wages, in the presence of a shipping-master, by whom their accounts are examined; and disputes as to the amount are often amicably settled; and thus a reference to a magistrate is avoided.

The waiting-room is open to all sailors, whether inmates of the Home or not.

In the cashier's office, all money transactions with reference to the boarders are carried on; and they are earnestly requested to lodge their wages in his hands directly they receive them. To encourage them to do this, every facility is afforded them for withdrawing any sums they may require, at any time between nine o'clock in the morning and five o'clock in the afternoon. Here, if they wish it, their tradesmen's bills, for clothes, and other things, are carefully examined and paid under their direction; and they are invited to deposit a portion of their money in the Seaman's Savings Bank; and when leaving London, to visit their friends, instead of carrying large sums in their possession, they may receive money-orders, payable, without expense, at their places of destination. The results of these exertions for the sailors' benefit is shown by the following figures: Since the opening of this establishment, the total amount of sailors' money received is 1,039,882*l.*; of this large sum, 372,387*l.* have been remitted home; 36,538*l.* invested in the Savings Bank; and 584,634*l.* drawn out by seamen.

There are two dormitories on the ground floor; and we may as well state here, that there are altogether ten dormitories in the building, which are similar in their arrangements. In each dormitory there are two stories of cabins, the upper row being reached by stairs and gallery. Each cabin measures about 8 feet 2 inches in length, 5 feet 1 inch wide, and 7 feet 2 inches high; there are a bedstead and bedding and a chair. The ventilation of the berths is very fairly attended to: between the rows of berths or cabins is a wide space, and large windows at each end admit a free passage of air. In some of the wards we found cabins expressly for the use of the chaplain and his staff. One curate, two city missionaries, and two scripture-readers, are attached to the establishment.* Here tracts are distributed, and such of the boarders as choose have the opportunity of hearing conversation and good counsel. There are lavatories in each dormitory, with water laid on.

In the waiting or public room there is a large bell, which sounds at certain hours of the day: for Morning Prayers, at half-past seven throughout the year; and Evening Prayers at ten. Breakfast at eight o'clock. Dinner at one (the dinner remains on the table for one hour, but if men are unavoidably away, they can have dinner till half-past two). Tea at half-past five (but tea is kept ready for those who may be late, in the kitchen below, until eight). Supper at nine.

The dining-hall is on the first floor, immediately over the waiting-room; it is a large handsome-looking apartment. well lighted and ventilated. It was during the dinner-hour when we paid a visit, and it afforded us the pleasure of seeing the well-dressed and intelligent-looking company which was here assembled. The tables were neatly laid, and all the appointments were similar to those of the large dining-rooms in the City; the attendants also seemed active and obliging. The following is the bill of fare for the day:—Breakfast: bread and butter, coffee, boiled beef, and fish. Dinner: soup, roast and boiled beef and mutton, meat pies, vegetables, pudding three times a week, table ale. Tea: bread and butter, tea; salad, radishes or celery, as an anti-scorbutic, throughout the year. Supper: bread and cheese, with table ale. The quality of the provisions was good, and they seemed well cooked.

The dining-hall is used also as a sitting-room for the boarders, and is furnished with draughts, &c. for their amusement. There is here a fine bust of Captain Elliot, the founder; and a beautiful model of a frigate. Adjoining the dining-hall is the reading-room, containing a line-of-battle ship's library (250 volumes), presented by the Lords Commissioners of the Admiralty; also a selection of books contributed by the Society for the Promotion of Christian Knowledge, and other friends, or purchased by the institution. The walls are hung with maps, prints, &c.; various periodicals are on the table; and both in this room and in the dining-room there are copies of the Scriptures, in several languages, for the use of the boarders.

On the second floor there are four dormitories; one of these was fitted up at the expense of the late Queen Dowager at a cost of about 500*l.* On the third floor there are two dormitories, and a school under the superintendence of the Lords of the Committee of the Privy Council on Education, where navigation, &c. are taught to seamen at a trifling charge. From April, 1861, to April, 1862, 238 pupils attended, out of whom 97 passed the examination of the Local Marine Board. On this floor is the board-room, in which is a museum which contains some choice models of ships and some curiosities.

From the top of the premises we descend to the basement. The whole has a comfortable appearance, and every one seems to be at home. We had almost overlooked the office for the enrolment of men in the Royal Naval Reserve: 516 names have been received during the last year.

The kitchen is large, and is fitted with Captain Grant's cooking apparatus and every other convenience. There are here also spacious coal-cellars, in which 100 tons of coals may be stored. There are also store-rooms and accommodation for the effects of absent seamen. There is also a room here connected with the Board of Trade, in which the unclaimed property of sailors who have died at sea is kept until it is applied for by relations. There are also refreshment-rooms for such boarders as may be too late for the regular meals in the dining-hall. In the yard there is a skittle-ground, and immediately adjoining the Home is the Sailors' Church.

Eight thousand seven hundred and forty-six boarders have availed themselves of this institution during the past year, of whom 2,760 are old friends; and those who come here are natives of many countries. Besides Great Britain, they come from the Channel Islands, British North America; 5,038 from Norway and Sweden; 3,102 from Germany; 1,214 from Denmark; 544 from Africa; 379, Australia and New Zealand; 5 are natives of Lapland; 5, Switzerland; and 97 born at sea. There are also sailors from the West Indies, Denmark, East Indies, Holland, Russia, Italy, France (761), Mediterranean, Belgium, Prussia, China, Spain, &c. The total number

* These gentlemen, besides their attention to the Home, have, in the year, visited no less than 13,541 vessels; read with 26,784 seamen; held 415 meetings; given away 74,426 tracts, and distributed 332 bibles and 72 prayer-books.

of boarders since the opening is 130,187. As regards terms, the men have to pay 14s. a week for living at the institution; ordinary seamen, under twenty years of age, and apprentices, 12s. a week: and this includes board, lodging, and washing. The large sum of 8,492*l.* 6s. 6d. has been received during the past year for the sailors' board; but the directors observe that their aim is not only to afford the sailor the security and comfort in the provision of a home to dwell in, but also to elevate his moral character; and for this purpose there must of necessity be attractions presented sufficient to entice the poor seaman from those allurements to sinful indulgence which beset his pathway at every step. To accomplish this, and to maintain in effective operation the great advantages of the Sailors' Home, some considerable dependence must rest on the public for support. Now that extension has become necessary, assistance is more especially needed; and when we consider that this is a model establishment, which has set the example and led to the opening of twenty-five other Sailors' Homes in various seaports of the United Kingdom, it seems surprising how little support this institution is now receiving in this great maritime country. A reference to the report shows that the amount of annual subscriptions is only 241*l.* 4s., and the donations 53*l.* 12s.; to which are to be added about 34*l.*, sent from Bath, Cheltenham, Guernsey, and Sheffield.

There can be no doubt that the Sailors' Home is well fulfilling its useful mission; and although we wish that such establishments should be self-supporting, and believe that eventually they will become so, it must be borne in mind that the difficulties of successfully founding such institutions as this are great, and that help is necessary until the prejudices which prevail amongst the classes who are intended to be benefited are removed.

We leave the Sailors' Home with feelings of satisfaction and of thankfulness to the late Captain Elliot, who, until deprived of bodily and mental energy, devoted all his powers, his talents, interest, and money to this his darling object of protecting and providing for the comfort of sailors. Connected with a noble family, and entitled by birth, education, and station to the advantages which the most exalted society could give him, he willingly relinquished all, took up his abode in a humble lodging, surrounded by gin-shops, near the Home; denied himself all the comforts, it may be almost said some of the necessaries, of life, in order the more effectually to carry out his benevolent design; and for eighteen years made it the business of his life to superintend this institution.

OBJECTS IN THE EXHIBITION SHOWN FOR ARCHITECTURAL BEAUTY.

The Society of Arts, unwilling to delay the publication of the Reports of the Exhibition Juries already completed, have determined to issue to the subscribers those they have received from her Majesty's Commissioners up to the present time. These will probably be delivered in a few days. Meanwhile, we reprint one on Class 10, Section C, which is signed Emile Trélat and Thos. L. Donaldson:—

The Jury have felt themselves much embarrassed in adjudicating upon the several objects which properly belong to this class in the Exhibition, from their being peculiarly connected with architectural beauty; some are not contained in the list of Section C, and others are dispersed in various parts of the building.

The list of the section in the catalogue of the United Kingdom only comprehends twenty-eight numbers, from Nos. 2423 to 2450 inclusive; many objects, however, are included within each number. But the articles exhibited by M. H. Blanchard (2428) and T. Pulham (2441) are of the same class of objects as those in Class XXXV. (Pottery), in which latter are many beautiful specimens of ornamental works, properly architectural. Mr. Poole (2440) exhibits a mosaic pavement; but other such works in different parts of the building seem to be excluded from this section, as also stained glass windows, the large class of Mediæval productions, parqueted floors, wrought-iron church gates and screens, paper-hangings, and imitative grained painting of marbles, wood, &c. Some admirable specimens of moulded ornamental bricks are included in Section A; otherwise they would have been specially noticed in this report. And even with these limitations the jury have felt themselves compelled to include in their awards some numbers of other sections of Class 10, in order to combine like objects in one decision.

If, therefore, the following awards do not embrace all the works of merit which might naturally be supposed to belong to objects shown for architectural beauty, the omission rests not with this jury, but arises from the special arrangement of the classification, whereby many things were examined and rewarded under other heads. In regard to those exhibited in the English division of this class, it is to be observed that many exhibitors seem hardly to have been conscious of the high standard of excellence that must be assumed in such international competitions, nor of the merits of their rivals in excellence. Nor have they been aware that, where the only measure of merit lies between a medal and honourable mention, the former must have a decided superiority, and must be distinguished by a high class of taste in design, as well as by excellence of material or execution. It may also be remarked, that except where architects have designed the forms and details of objects executed under their own immediate direction, there is a great want of the artist's taste to give the productions that elevation and grace of design and purity of form, so necessary for works of art, carried out in whatsoever material. The exhibitors rarely do justice to themselves in the terra-cotta works, giving to their products bad forms, proportions, and details, to which, however, such manufacturers as Minton, Maw, and Blashfield are remarkable exceptions. When colour forms an element of beauty, as in the contrasts of inlaid marbles for tables, there is too frequently a deficiency of harmony, even in those of Italy, arising from an absence of the just appreciation of the relative value of tones. So that, however meritorious the workmanship, it will not redeem the defective arrangement of the brilliantly coloured marbles themselves, which are thus rendered devoid of expression and feeling. Very frequently there is an ignorance in these classes of manufacture of the choice of subjects and objects which should properly form the basis of such combinations. It may be said that the artist element is too often ignored in the English products of this Class X., Sub-class C; and thus full justice is not done to the material employed, nor the labour bestowed in the execution.

In the collections of terra-cotta productions there is evidence of a very considerable advance, both in regard to the quality of the material and their application as ornamental objects for architectural purposes. Thus there are several forms of moulded bricks, black, yellow, and red, enabling the architect to vary his decorations in a very simple manner. These, however, more properly belong to another section, where they are enumerated. There are specimens of ornamental columns with bases, shafts, and capitals, exhibited by Messrs. Maw (United Kingdom—2318), and Mr. Blanchard (United Kingdom—2423), thoroughly burned, retaining well their forms, and which have been largely employed in the arcades of the Horticultural Gardens, where they are very effective. Messrs. Maw exhibit an example of one, the parts of which are elegantly relieved by a partial application of glazed colour. There are several instances of moulded decorative chimney-pots, admirably adapted for the purpose, and a great variety of roof-tiles and crestings. Another very important application of this material, and which has received full justice in this Exhibition, is floor-tiles for churches and other public buildings and private dwellings. This does not appear to have had in the Classic period a similar development. The clay adopted for the purpose is of the best quality, carefully prepared, pressed, and burned till it acquires a most enduring hardness; and the article is turned out of hand perfectly square, so as to fit in with the greatest nicety into patterns, however intricate. There are several manufactories which produce first-rate articles of this class in point of quality; but Messrs. Minton and Messrs. Maw evince the greatest perfection, both in quality and in the varied taste of design and colour; and the former firm give great brilliancy to their encaustic tiles, which rival those of the Moors in the Alhambra of Spain. The name of Messrs. Minton's artist is not mentioned, but their efforts are most ably seconded by their designer, both as to combination of forms and the harmony and contrast in the disposition of the colours. Mr. Digby Wyatt is named in connexion with the works of Messrs. Maw. The jury have therefore thought it due to that gentleman and to Messrs. Maw, who have had the judgment to call in the aid of an artist of such distinguished merit, to award a medal to Mr. Wyatt also. Another application of a like nature occurs in the Belgian department, where Messrs. Boch, Brothers, of La Louvière, Hainault (Belgium—303), exhibit mosaic tiles and slabs for pavements, simple in pattern, excessively hard, and very cheap. Messrs. Minton and the firm of Maw also bring under notice mosaic pavements, which for execution are nearly on a par with those of the antique, of which so many noble specimens still exist in this country, as in Leicester, Cirencester, &c. This firm have in their court a central pavement floor ten feet square, composed of tesseræ and mosaic tiles and slabs judiciously intermixed. The specimens of pottery exhibited by Mr. Blashfield (United Kingdom—6833) are very remarkable for the quality of the material, the gracefulness of form, and the sharpness retained in the ornaments, so as to be able to rank with a very high class of art. There are some fine vases of elegant design, and which ring like a bell when struck; and of this class of object it is impossible to pass over the coloured and enamelled vases and pedestals and other architectural features in Messrs. Minton's collection, which may be favourably compared in every respect with those of the schools of majolica in France and Italy of past times.

Mr. Blanchard, pursuing his endeavours to apply this material of terra-cotta to purposes at once useful and ornamental, has ingeniously prepared the steps of a staircase inlaid with coloured tiles in the tread and riser.

It is to be observed that F. Erndt, jun. (Austria—1387), C. Vidal (Denmark—299), and P. Carafa di Noia (Italy—1142) also exhibit very creditable works in terra-cotta.

There is a large variety of marble chimney-pieces for fire-places of rooms, some of which have come under the notices of this sub-class. That by the late Mr. John Thomas (United Kingdom—2446), chief carver of the monumental and historical statues of the Houses of Parliament, merits notice on account of the elegance of the design and delicacy of execution, it being intended for Her Majesty the Queen. And there are several in the Belgian section; one by Mons. A. J. Leclerq (Belgium—318) is remarkable both for design and execution; another by Mons. L. Boucneau (Belgium—305) is distinguished for the execution, though faulty in design. It may be stated generally that the Belgian objects are remarkable for the cheapness of production. In the French collection a monumental marble chimney by Gouault (France—2862) is a very imposing work of art, no less to be admired for its masterly execution.

Serpentine and granite are well illustrated in the Exhibition, and have been ably applied for architectural purposes, as columns, fonts, pedestals, fountains, vases, tombs, tables, &c., &c. Specimens exhibited by the Serpentine Marble Company (United Kingdom—2444) and by the Lizard Serpentine Company (United Kingdom—203) are of a more compact and uniform quality than those originally extracted from the quarries, and admit of a higher polish. The variously toned specimens are made harmoniously to combine in colour, and the objects are finished off with the utmost perfection. Mr. A. Macdonald, of Aberdeen (United Kingdom—214) maintains the high reputation of the Peterhead granite quarries, both in the beauty of the material and the mode in which it is applied to architectural purposes; while Messrs. Freeman, also, in another class, exhibit fine specimens of the polished grey from Plymouth, in columns and architectural features of very faulty design and profile, utterly unworthy of the noble material

The onyx, from Oran, in Algeria, is one of the finest materials recently discovered (like our serpentine), and applicable to ornamental architectural purposes. Mons. Pallu (France—2871) deserves great credit for the manner in which he has introduced this exquisite material as decoration in balusters, pedestals, chimneys, and other objects, producing great brilliancy of effect.

The introduction of coloured marbles, as an essential feature of architectural embellishment, has made great progress in this country of late years, particularly in works of Mediæval design; and the present Exhibition is not without some very creditable specimens, both for design and execution. Messrs. Poole & Son (United Kingdom—2440) exhibit a doorway of the Transition period from the Norman to the Early Pointed, having the shafts of the columns of variously coloured marbles: it is destined for the Digby mortuary chapel. They have also an elaborate mosaic pavement for Chichester Cathedral, admirably designed by Mr. W. Slater, the architect. These works are of such high merit as to design, arrangement of the coloured marbles, and the execution, that the committee felt they would be unjust if they did not award medals both to the architect and mason, on whom they reflect so much credit.

The objects produced by Mr. Magnus (United Kingdom—2435) confirm his reputation for the admirable manipulation and treatment of enamelled slate, and the beauty of its application to various architectural purposes, imitating the choicest marbles on a most durable material. The Llangollen Slab and Slate Company (United Kingdom—204) also exhibit some specimens of enamelled slate, and one enormous slate slab, which reflects credit on their spirited energy, and is an instance of very superior material.

Mr. J. Forsyth (United Kingdom—2430) has some carved wood bench ends clearly and elaborately cut, and with great attention bestowed on the natural character of the foliage, without sacrificing the artistic treatment which vegetable substances should receive when introduced as ornament, whether in wood, stone, or bronze. And the Ecclesiological Society (United Kingdom—2425) have exhibited some highly-wrought and well-understood wood carvings of foliage, very ably executed by H. Reynolds, E. J. Herley, H. J. Wicks, J. Seymour, A. Angus, and E. Du Jardin, to whom that society had awarded certain prizes for these works in competition. The jury were glad to observe the superior class of wood carving, and the progress made in it within the last few years under the able architects who have been particularly engaged in the Mediæval style. A like, if not superior, excellence is evinced in many French and Italian specimens of the Classic style; but they, doubtless, have been reported upon in the Furniture department. As an imitator of wood and stone carving, Mr. Jackson (United Kingdom—2434) must be mentioned for the perfection to which he has brought the manufacture of carton-pierre, for architectural decoration,—a worthy rival of his French competitors in that material.

The specimens of cast and wrought iron metal work, both French and English, are of the very highest order; some of the finest specimens being for objects included in another class, will be doubtless mentioned with due honour. In this class, McFarlane & Co., of Glasgow (United Kingdom—2,313) have some admirable castings in iron for open ornamental crestings, panels, finials, as also for moulded rain-water gutters, pipes, heads, and shoes, sharp, clean, and full of character. Mr. Durenne (France—3,035) exhibits a cast-iron monumental fountain remarkable for the execution of the details and delicacy of the moulding. And with these may be favourably classed the productions of Messrs. Monduit & Béchet, of Paris (France—1,259), Grados, of Paris (France—1,283), and Michelet, of Paris (France—1,284), who have executed many fine ornaments and statues on the Sainte Chapelle and other Mediæval buildings of that city in embossed lead or zinc. These materials are less apt to be affected by the atmosphere than iron, and some are of colossal size, evincing great boldness and finish, and refined artistic treatment at the same time. In order to counteract the action of water on iron, which threatened to destroy some of the finest monumental works of art in Paris,—as the fountain in the Place Louvois, by the late M. Visconti, and the fountains in the Place de la Concorde and the Champs Elysées, by M. Hittorff,—executed in that metal, M. Oudry, having made various experiments, discovered a process of coating in bronze, which has been applied with great success to those noble productions, and to more than 1,000 elegantly-designed lamp-posts. M. Christofle, the eminent silversmith, has also of late years applied the galvano-plastic system to architectural details such as stair rails, balconies, elaborately enriched mouldings, capitals, and other portions of columns; so that architects may find in this system the possibility of carrying out their ideas, even of the most elaborate ornament, at relatively moderate cost.

There are very few objects of industrial art contributed by Russia to the section, but they are of the very highest class of excellence, whether considered for their tasteful design, the preciousness of the materials, or their perfection of execution. All which have been selected are of too high merit to be noticed merely with honourable mention, and have consequently been awarded to receive medals.

The contributions from Malta are limited to carved stonework and inlaid tables, most patiently and elaborately executed. But the stone carving evinces a sad absence of correct taste. It is to be hoped that the Government will turn this industry to an honourable and really useful account, by assisting the workmen in their art education, and sending them to the schools of Italy or France, to acquire that correct knowledge of true art of which they are now so lamentably ignorant.

There are only two specimens of ornamental stucco in the Exhibition, but they are the productions of two of the most eminent houses in London and Paris, Bellman & Ivey (United Kingdom—2,238) of the former city, and M. Crapoix (France—1,260) of the latter, and they cover only a small surface; they are, however, remarkable for the evenness and lustre of the surface, the choice of the material, and the brilliancy of the colours, tempered by judicious treatment.

This brief and imperfect summary of the more important objects of this class cannot be better concluded than by reference to two illustrative literary productions immediately connected therewith. The one is an atlas series of the most exquisite drawings, executed with all the refined taste of the French school, illustrating the stupendous and admirable works of embellishment and practical use which have been carrying on of late years in Paris under the government of the present Emperor, and which have changed the whole aspect of the French capital, and accomplished for it far more than Augustus did for Rome. The clear intelligence, the firm will, the science and taste which have conceived and carried out these important alterations and enlargement of Paris deserved to be recognized when brought under the notice of the jury. The names of Messrs. Alphand, Engineer-in-chief of Bridges and Roads, Darcel, Grégoire, and Foulard, appear as engineers; and those of Messrs. Davioud and Barillot-Deschamps as architects. But there have been other master-minds who have contributed to these great results, and whom it would be out of place here to notice. The jury, however, could not but award a medal to this record of works worthy the present age of progress and improvement, and of the enlightened Ministry of Commerce, Agriculture, and Public Works at Paris.

The other literary object which has been exhibited in connexion with architectural beauty is also in the French section, and consists of a frame containing specimens of the engravings—some in line and one coloured—published in the architectural periodical, called the "Revue d'Architecture," edited by Mr. César Daly. So great have been the services rendered by that distinguished architect in illustrating the history and construction of the works of past times, and in recording the details of those erected at the present, thus contributing essentially to the diffusion of taste and an accurate knowledge of architecture in all its details, that the jury concurred in bearing testimony to the intelligence and public spirit with which Mr. Daly has, for above twenty years, conducted his valuable journal, by awarding him a medal.

ARCHITECTURE AT UNIVERSITY COLLEGE.

In announcing the commencement of his architectural courses on Tuesday, the 14th instant, Professor Donaldson says,—

"I trust I may be allowed to avail myself of the privilege, which I have enjoyed for so many years, of offering a few observations in connexion with architecture and construction, more particularly in reference to the state of those branches of knowledge at the present period.

It was asked not many months ago in a public assembly, '*What is an architect?*' This question was put, whether in jest or in earnestness I stay not to inquire, by one who professes himself a cultivator of art,—by one who stands at the head of the central artistic educational establishments of the empire,—by a man of the world and surrounded by art associations. The question was answered eighteen centuries ago; for Vitruvius thus defines the architect:—'Architecture is a science arising out of many other sciences, and adorned with much and varied learning. Practice and theory are its parents. An architect should be ingenious and apt in the acquisition of knowledge—a good writer—a skilful draughtsman—versed in geometry and optics—expert at figures—acquainted with history — informed on the principles of natural and moral philosophy—somewhat of a musician—not ignorant of the sciences, both of law and physic, nor of the motions, laws, and relations of the heavenly bodies to each other—above meanness in his dealings—avoiding arrogance — just — compliant and faithful to his employer.' It is not for me to say, if the architect of the present day do or do not come up to this high standard, summed up in these words. But I dare aver, that there are works of the last quarter of a century alone in this metropolis and throughout the United Kingdom, which may rank with any produced during the last four centuries. And, if these be not sufficient, I would appeal to the frank and generous convictions of the querist himself; and ask, in return, if the great European struggle for the Public Offices at Westminster, and the triumphs accomplished by our architects in the Continental competitions at Lille, Hamburgh, Turin, and elsewhere, do not prove a powerful movement and a real life in the profession; and that we have men of noble aspirations and high mark, equal at least to those of any country.

Yet these results have been realized in spite of the difficulties and deficiencies in regard to professional education, with which they have had to struggle. Conscious of the scarce opportunities they had in their youthful instruction, the architects of the present day have resolved to afford the student of the rising generation a proper estimate of the qualifications necessary to fit him for his future career. The Royal Institute of British Architects has published a scheme of public examinations, embracing a curriculum, as comprehensive as that of Vitruvius, and opening a wide sphere to the ardour and ambition of the younger members. To reach the standard contemplated, the student must enter upon the pursuit with determination, devotion, and self-negation. He must acquire a positive, serious, thorough knowledge of his art; for a mere superficial empirical smattering will not suffice. He must rise equal to the demands upon his inventive and practical faculties.

To meet such a requirement, the courses of study laid down by this College for the architect and engineer afford every facility, seconding the experience to be gained in the office of the architect. The series of lectures on architecture and construction can be combined with those on engineering, natural philosophy, mathematics, chemistry, and geology, under my colleagues, professors of the highest character. Thus may the student prepare himself with the qualifications to meet the examinations contemplated in the broad scheme of the Institute; and be enabled to take up that position which is the best guarantee for his professional success in after life.

I should also observe, that the principles taught in my lectures are of such an elementary character as to be no less beneficial to the builder. They give him a knowledge of the properties of materials and their proper structural application and combination. They thus enable him to carry out the buildings, he may be called upon to erect, most economically and soundly; and, in point of style, with a certain knowledge of artistic propriety."

COMPETITIONS.

Harrogate Cemetery.—From amongst upwards of forty designs sent in for competition for chapels, lodge, &c. the burial board have awarded the first premium to Mr. Thomas Charles Sorby, of 3, Lancaster-place, Strand, London; and the second to Messrs. Bellamy & Hardy, of Lincoln.

North Staffordshire Infirmary.—Sir: If the committee appointed to receive and adjudicate upon designs submitted in competition for the above purpose are not *incorruptible*, the labours of competitors will be in vain, as I learn from undoubted authority that a certain professional is now, and has for some months past been, actively using every known means to secure the job. T.

Leeds: Baptist Chapel, Woodhouse Lane.—With reference to our statement, on authority, in an earlier number (p. 656, *ante*) that the design of Messrs. Paull & Ayliffe had been selected, and would be carried out under their superintendence, Messrs. Lockwood & Mawson have sent us a copy of a letter of later date, received by them from Mr. Holroyd, for the committee, saying:—

"I am requested by the building committee to thank you for the plans submitted to them, and to inform you that they have awarded the first prize to the Gothic design.

I beg herewith to hand you a cheque for 20*l.*, being the amount of the 1st prize. The plans are now at your disposal."

Are we to understand that the first "prize" is awarded to one design, and that another design is selected to be carried out?

Completion of the Metropolitan Railway.—The works may now be said to be complete, the small amount that remains unfinished being very minor details and decorations. Colonel Yolland, the Government inspector of the railway department of the Board of Trade, finished his inspection of the line on Saturday, and the company now only await the receipt of his certificate to open the railway to the public.

NEW CONTRIVANCES ANCILLARY TO ENGINEERING.*

In the world's progress these exercise no small influence. The Greeks of old would have produced steam-engines easily enough, had only the metals and tools been forthcoming for handicraft, the predecessor of steam-working. Invention is of two kinds—that which is produced by abstract thought, converting the powers of nature to many uses; and that which is produced by obvious defects in existing practices. The former is forethought or invention: the latter is afterthought or contrivance. The former springs spontaneously from the inventor's mind: the latter is forced on the workman's attention. Invention is in truth the parent of contrivance, the idea giving birth to the practice; as we constantly see, after every new discovery made the subject of a patent, a host of new contrivances springing up in a circle of patents like the satellites round a planet. But though the contrivances may appear small as regards the mental effort involved, any perfect result produced by them may make all the difference between success and failure. Quarrying was an art anterior to gunpowder; but great was the labour-saving achieved by the man who first applied the powder; contrived the means of boring a deep hole in a hard rock; and brought the tamping process to perfection. And great must have been the exultation over the first production of that apparently simple tool the "lewis,"—a wedge split into three parts to fix a ring into a stone block in an undercut hole to lift the heavy weight, not otherwise to be moved without damage. Making steel, or finding it made by nature, and forming it into a chisel to cut hard materials, was also an achievement; and so throughout the whole of the engineering processes. What is engineering but the conversion of the materials of nature into new forms and shapes useful to man by the agency of mechanical and chemical art? The engineer proper is, or should be, the designer of the new and useful forms, the vice-creator, varying by art the direction of the laws of nature; yet how little would he really achieve without the aid of the numberless contrivances that make up the great whole of engineering progression, which is still only in its infancy!

There are two branches into which engineering divides itself;—that which deals with stationary or fixed matter, and that which deals with moving matter. The former takes in the structure of roads, bridges, buildings, docks, harbours, the guidance of rivers, and the drainage of land—converting bogs and fens to healthy human uses. The latter takes in all that moves,—engines, vehicles, machines, vessels on water, tools of peace and tools of war, mines, water supply, air supply, and heat supply, and also the processes, hitherto only empirically applied, of diminishing heat for the purposes of health, in particular rooms and climates.

We are accustomed to regard architecture and engineering as being two separate things, and common practice has divided them. It has been said that an architect's engineering and an engineer's architecture are the two extremes of bad result; but there is a worse condition than this, when a man unites the professions of architect and engineer in his own person, without any natural qualification for either. At the base of all good architecture must lie good engineering: the structure must have proportion in strength upon which the proportion in form must be based: the architecture is the flesh upon the engineering skeleton; and when an empirical practice obtains in any class of structure, engineering and architecture cease, and the "builder" takes their place, commonly without any knowledge of principles of structure, his practice going chiefly into economy of cost.

When once a particular class of structure has become stereotyped, the contractor and builder take the places of the engineer and architect; but we can no more compare the former with the latter, than we can compare the modern teachers of alphabets with Cadmus, their inventor. The true engineers and architects are those who have the designing power in the new and useful, and the beautiful; and these men exist now, as ever, when the demand arises for their talents by new conditions of circumstances.

The materials of stationary structure are natural and artificial—timber and stone, bricks, cements, and metals. Neither timber nor stone is in all cases durable. To provide for the former we artificialize it by chemical injections, as creosote, lime, and other substances. The former renders it durable, but combustible; the latter renders it brittle; and therefore these contrivances are imperfect. Stone is not often chemically homogeneous, and it is liable to destruction by exposure to a vitiated atmosphere. For this reason it has from very early periods been waxed, painted, varnished, and injected; and, in these modern days, artificial stone has been produced by chemical contrivances, with the advantage of being moulded into shape without the labour of cutting. Brick or *terra cotta*—literally *cooked earth*—is a more durable material than many kinds of natural stone; and, as experiment goes on improving and cheapening the processes, it will probably be rendered indestructible by the atmosphere, whilst chemical cements, combining with mechanical form, will render it homogeneous. Many are the chemical and mechanical contrivances that have already given value to and cheapened bricks; but, for all that, a brick building is still a very imperfect kind of structure. Chemical cements are in truth artificial stone, of better or worse quality, used for joints and as a cover for other material. Cement, rightly made and cheap enough, is a material to form buildings and bridges as one solid rock; and this is done by the French under the name of *béton*. If chemically impervious to the atmosphere, this would be the best class of structure for walls, buildings, and bridges, unless want of space should render it desirable to use the stronger and thinner material, metal.

For moving matter, engines, vessels, carriages, machines, and instruments of peace and war, metal is fast becoming the cheapest and most available material. With a given weight in a large vessel, iron will carry a greater load than timber; yet it is little over thirty years since iron shipbuilding became a practice. What a host of brain-working contrivances have they been which have enabled us to cut masses of iron as we do cheese ere the original iron vessels, looking like pots to boil entire whales in, culminated in a *Warrior;* still only an approximation to what we must ultimately achieve ere the world will be satisfied that England is only the veritable policeman of the ocean, permitting no seawayman of violence to harbour thereon. We have yet to weld our sea *Warriors* into one homogeneous mass, dispensing with rivets and joints; we have yet to make the iron hull a surface to which neither corals nor lichens nor barnacles will adhere; we have yet to liken the speed to that of swift fishes or locomotives on land; and we have at the same time to make such craft wholesome, pleasant, and safe dwellings for our sea warriors against sea and rock and foemen. But space is denied us to say more now.

Iron Girders for Bridges.—Since the advent of railways, roads have become more level than of old; arched bridges of stone cease to meet the requirements of the time, and flat girders of wrought-iron are rapidly taking their place. There are two principles employed in iron girders, compression and tensile strain; the tensile principle being unknown in stone bridges. In wrought-iron the power of tension and compression may be assumed to be nearly equal, if they could be tried under the same conditions. The compressing action has a tendency to flatten the molecules transversely: the tensile action has a tendency to flatten them longitudinally. But in the two operations a new element comes in, that of "buckling." With the tensile strain the bar is drawn to a straight line; with the compressive strain the bar is constantly thrust into a curved line, unless it be of large dimensions. For this reason an iron wire, to which a heavy load may be safely suspended, will scarcely support a fractional part of that load under compression in the same length.

In constructing a straight girder, it is usual to make the total depth from top to bottom one tenth or twelfth part of the total length. The upper line must have sufficient area to counteract buckling, as well as sufficient strength to resist crushing. The lower line is simply a chain or cord of links or plates. The ultimate resistance to breakage must depend on the links or chain below. It is obvious, therefore, that the most favourable condition for the use of wrought-iron is that of tensile strain.

In this Exhibition there are many drawings and models of iron- suspension- and other bridges. We have the design for the Charing-cross Suspension and the Clifton Suspension. We have the triangulated girder, exhibited by Colonel Kennedy, the engineer of the Bombay and Baroda Railway, as a sample of the rigid girder. We have an enormous box lattice of the Zollverein, and also a similar kind in the Austrian department. In the French department we have a sample of a framework of wrought-iron, a top and bottom open frame held together by similar vertical framings, with millions of rivets. And we have also the peculiar suspension bridges of Mr. Brunel, in which chains are suspended from tall towers to carry a roadway; and, in order to dispense with anchoring chains, the towers are framed together with wrought-iron tubes, in order to prevent them from pulling over with the weight.

In the Austrian department is exhibited a rigid suspension bridge, the best construction that has yet appeared for the disposition of the material, by Schnirch and Fillunger. A bridge of this class spanning the Danube at Vienna has now carried two lines of railway since September, 1860. The span is 274 feet, and the width 36 feet. The weight of material is 490 tons of wrought iron, and 41 tons of cast iron; total, 531 tons. On each side the chains are doubled, and formed of links 10 feet in length, in numbers eight and nine to each chain. One chain is 4 feet above the other in a parallel curve, the links breaking joint. Diagonal bars, serving both for thrust and tension, stretch from the lower bolts to the upper, in a triangulated form. Thus two diagonals and a chain link form a triangular truss, and the whole forms a rigid suspension beam, the ends rising at the towers to three times the central height, and the level roadway is suspended from the link bolts. It is stated that an ordinary lattice bridge for the same span would have required 802 tons of metal.

It appears, therefore, that while a straight triangulated girder requires a depth equal to a tenth or twelfth part of the length, to prevent buckling, one-seventieth of the length is sufficient for triangulated suspension chains, while the rise or gradient of the chains is only about one in seventy. Pressure on the model gives satisfactory proof of the stiffness and freedom from oscillation, both vertically and laterally, without the aid of stay chains or ties. The only disadvantage in the bridge, as compared with straight girders, is the necessity for towers and anchoring chains to balance the weight of the load, and prevent the towers from pulling over.

In juxtaposition with this model is exhibited another model the exact reverse in principle. It is a triangulated girder in an arch form, composed of similar links and triangles, but all in cast-iron, acting wholly by compression. The links are practically shortened to one-half by stay bolts passing through their mid length, to prevent them from buckling. An enormous mass of stays and ties and diagonals pervade the structure, which is complicated in all parts. Massive stone abutments, equal to half the length of the bridge, are required to sustain this thrust both ways. If cast-iron bridges are required in an arch form, the best and simplest structure is that spanning the Thames at Southwark.

In materials for girder making, the Butterley Iron Company have been the most successful. They have produced a wrought-iron beam, the vertical web of which is 3 feet in depth, and the top and bottom tables each 9 inches wide, the whole well proportioned; and it is stated that these beams can be produced 60 feet in length. The beam is rolled in three pieces, the two tables and a broad middle web, and welded up in two seams; but the producing it in one single piece is simply a question of larger rolling machinery. When these beams are produced homogeneously, bridge building will become a very simple process.

Chains.—Years back a Corsican captain of the sea, named Sisco, having experience of the breakage of chain cables made in the ordinary manner, set himself to devise a better plan. It is a known quality in iron and steel, that the smaller the size the more perfect may be the manufacture. Thus, if rolled iron of one inch in diameter will carry 28 tons, the same weight of metal in fine steel wire will carry 120 tons. Sisco was not successful in making and welding thin links with wire, and so he tried the same with iron hoop, the laminæ of which he brased together, and was successful. His cables, with hoop-iron links, sustained a far greater proportional strain than those of solid iron. The Corsican found a capitalist in Madame Sinibaldi to enable him to take a patent in England. So far back as 1851 experiments were tried at Woolwich with 4 square inches of section, when they broke, the 2½ testing chain at 110 tons, and since then they have been tested up to 120 tons. From that time to this Madame Sinibaldi has toiled on, hoping against hope; and now she sits at her table in the Exhibition with her chains and links and samples before her, explaining them to all, like a brave woman as she is; and she in-

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* We give this chapter, by Mr. Bridges Adams, C.E., from the "Practical Mechanics' Journal Record of the Great Exhibition," as an example of the way in which it is dealing with the International Exhibition. The Record is fully illustrated with engravings, and published by Messrs. Longman, Green, & Co.

sists on the applicability of the system, not merely to chains, but to armour plates. But she also, in the usual process of inventive improvement, has had to find a capitalist, and he has turned up in the person of the Duke of Buccleuch, who has become the proprietor of all the patents taken and to be taken for "cold rolled iron brased." We trust he may succeed in getting a perfect manufacture set up at Woolwich. It involves little expense on the trial, and the samples shown are susceptible of great improvement.

The toughest iron known in former days to sustain a strain without breaking was called scrap iron. There was no brittleness in it, though it would stretch. Toughness is virtually, from experiment, the quality needed in armour plates; and military cuirasses of hammered iron were better and tougher than if made of steel. To make a hoop iron cable of cast-iron would be a simple matter: to make an iron plate, drawn together in thin sheets, would be a more difficult thing, but not necessarily would it be more costly than the present method of building together bricks of iron like a brick wall. It is one of the processes that is worth trying, and the Woolwich authorities could try it. Whether boiler plate brased together in thicknesses would answer, we do not yet know, and we ought to exhaust the subject lest some one else should do it for us.

In making a chain, it is evident that if a closed link be first made the next one should be an open link to enter it, and so on. With solid round iron the open link is closed by the welding process, and the efficacy of this must depend on the skill and honesty of the workman. If during the process of heating atmospheric air gets access to the surfaces intended to be united, they will scale; that is, a thin scale of oxide of iron will be interposed between the surfaces, and the result will be contact without incorporation.

On the Sisco plan a very ingenious link mould revolving by steam or other power is made to wind up the hoop into link within link; when completed the mould opens, is again applied, and so on in succession. There can be no error in this, no defects, for every portion of the iron is seen as it winds up, and the strain put on each layer may be regulated. The workman sits in an ordinary atmosphere, and his eyes are not strained or burned with heat. When a sufficient number of links are in position they are plunged in a bath of melted metal, and the whole of the laminæ are bound together. The whole is galvanized, and the cable is free from rust: central studs, and end wearing pieces are then brased in so that each link assumes the same geometrical form as ordinary chain links, giving the strain in straight lines. There is no other mode of getting the strongest metal of iron and steel than that of making it in small sections, that we at present know of, and probably steel hooping would be better than iron.

Lifts.—Amongst the useful things that have been strangely neglected in general application, is that of self-acting lifts for ascent to buildings and descent, and especially of human beings; and this is more remarkable as the types of the principle are to be found in every window with a balance weight, and every spring blind. In cottage houses all ground floor, or in houses with a single story or two stories, the staircase may suffice, although it is a contrivance occupying great space; but with the tendency to economize space by the erection of lofty buildings with many floors now so prevalent, one of the great wants of the age is a simple process for lifting persons and goods. When steam power exists there is no difficulty whatever; and a domestic power by steam or other process has yet to be brought to bear. Possibly heated air machinery without risk of explosion may eventually suffice, as small power only is needed. Whoever shall accomplish the task of enabling the inmates of dwellings to lift themselves from one floor to another by simply pulling a cord as they would a bell-rope, and thus dispensing with the staircase and the expenditure of muscular labour, will be a very large benefactor to society. And it must be remembered that a very important condition of health is to live at a considerable elevation above the surface of the earth, so as to obtain pure and dry air away from miasmatic exhalation. There is a record of the days of London plagues, recounting how a citizen closed his doors and retired to the upper floors of his house with his family, lifting all provisions by a rope, and, while his neighbours died around him in shoals, was saved from all harm.

Messrs. Lawrence exhibit a lift for London warehouses. A platform is made to move vertically between four guide posts. The weight of the platform is balanced by a counterweight. For the purpose of hoisting goods a rope is connected with a crab tackle below. This is a very useful approach to what will be wanted for future times.

Mallet's Buckled Plates.—Amongst the important contrivances exhibited are the buckled plates of Mr. Mallet. Everybody knows what corrugated iron is, that it gives greatly increased stiffness to any thin metal, but it gives this stiffness only lengthwise with the corrugations. The buckled plates give stiffness in all directions; they practically form flat domes of enormous strength with a very slight depth of buckle. The process of manufacture is to strike the flat plate between two iron dies, which, while leaving the edges in their normal flat form, raises the centre from a tenth to a twelfth of the breadth in height, in a curved elevation. The flat edge or base being screwed down to timber or iron joists, the elevation makes the plate enormously strong vertically, while the weight is comparatively trifling. This contrivance is one of the happy thoughts that embody great utility, as it were, in a flash, and remain complete from the outset. It is used for many purposes in floors and bridges, and there are many more uses to which it will yet be applied.

ON TASTE IN ARCHITECTURE.

In an article on Mr. Viollet Le Duc's "Dictionnaire Raisonné de l'Architecture," which is now in its sixth volume, the *Parthenon* gives a translation of part of the author's article "*Goût*," which, without having any claim to originality of view, may serve as an example, for such of our readers as do not know the work, of Mr. Le Duc's teaching:—

"There are periods, happy ones for Art, when the word Taste stands in no need of definition. It exists by the mere fact that Art is a truth, that it submits to the teaching of reason, that it does not repudiate its origin, and that it speaks only when it has something to say. In periods such as these, people do not trouble themselves to lay down rules of taste; just as, when you are among honest men, you do not tease yourself by discussing what is lawful and what is not. People begin to talk of taste only when it is leaving art generally, and is taking refuge in the intelligence of a few special artists. People never write books upon virtue, except when vice is predominant. Those happy periods are now far removed from us: they existed among the Greeks: they flourished during the Middle Ages; and they might possibly revive again, if it were made a condition that taste should consist in the observance of simple principles, and in the preference of one kind of form over another. When taste becomes shut up within the limits of a coterie, no matter how influential, it degenerates into nothing better than miserable pretentiousness, from the effects of which everybody is glad to escape; for taste, real good taste, possesses this privilege, that, like everything else intrinsically true, its authority continues to exist notwithstanding the lapse of time, and in spite of every prejudice. At the present day, however, people are hardly agreed among themselves as to what taste really means. When it is a question of architecture, people maintain thorough heresies in matters of taste; and continually bring forward, as models, works the meaning of which it is impossible to make out, and which are only remarkable for a total disagreement between what they look like and what they are meant for. They tell us, for instance, that such and such a façade is in good taste. Why is it so? Is it because all its parts are symmetrical; that it is ornamented with columns and statues, and that numerous decorations are scattered all over it? But, then, this external symmetry conceals not one but a great many different structural purposes: here there is a large saloon, there you have boudoirs; further on, a staircase. This window, however, which is to light the apartment of the owner of the residence, is of exactly the same size and form as that other one which opens only on a side passage. Those projecting columns, do they show the existence of party-walls, and are they intended to act as buttresses? No: the party-walls are placed on one side of the columns, and not in the line of their axes; and buttresses would be superfluous, because the joints do not even have their bearings upon the front wall. We observe niches cut out in the middle of blocks just in the very places where, of all others, we require firm points of support. Now, if we make a joke of persons who wish to appear what they really are not; if we despise a man who attempts to impose upon us in respect of his worldly condition and place in society; if we consider his manner of going on to be in extremely bad taste;—why do we call it good taste to raise up a façade fit for a palace in front of only a number of clerks' offices; to place colonnades before walls that have no need of them; to construct porticoes for loungers that have no existence; to hide roofs behind attics as something not to be seen; to give to a town-hall the look of a church, and to a court of justice the appearance of a Roman temple?.....The first and principal law which the Mediæval builders laid down for themselves was that of perfect sincerity. Had they got stone, or wood, or metal, or cement to work with: then they allotted to each of these materials the usual form, structure, and decoration that was suitable to it.....For them, a hall really was a hall; a house was a house; a palace, a palace; a church, a church; a castle, a castle; and it never came into their heads to give a municipal building the outline of a religious one, merely to please the eyes of cockneys—who, by the way, are always great lovers of symmetry. Have they got to cover in such or such a hall with a roof of wood: then it will be a wooden—boarded—roof that we shall see, not a sham roof, made to look as if it were of stone. Have they got to make a ceiling: then the structure of the woodwork above will mark out the compartments and give the decoration. . Is it to be a gallery that is to pass behind this wall: then we shall recognize it on the outside by the manner in which the lights are pierced for it. Is it to be a grand hall: then the windows will be wide and lofty. Is it to be a range of cells: then the windows will be small and numerous . . To know how to say only just what ought to be said, and to say it in a proper manner, is a proof of good taste in the common relations of life. Very well, then: it is a proof of a very small degree of good taste to give the house of a simple individual, inhabited perhaps by several tenants, the appearance of a palace! 'But,' you will say, 'if the owner of the house can pay for all this grand appearance, why should he not indulge his fancy?' Be it so: let him do it; but you will never hinder us from thinking that the architect, as well as his client, have each of them bad taste; and that the extravagance of the one does not excuse the complaisance of the other. . . . . It can never be denied that our churches of the Middle Ages, large or small, perfectly fulfilled the objects for which they were intended; that their plans were well conceived,—because, since those times, no better ones have ever been invented; and that, even at periods when Mediæval architecture was considered barbarous, builders did nothing more than copy these plans, though they generally spoiled them. That grand arrangement of chancels with side-aisles, which is peculiar to the Middle Ages, is not only suited to its object, but infallibly produces an immense effect. Now this arrangement is simple, easy to understand, favourable to the development of ritual ceremonies, and admits of sumptuous decoration. Everywhere it allows of easy circulation, of air, and of light. If, in our castellated buildings of the thirteenth, fourteenth, and fifteenth centuries, we do not discover the symmetrical arrangements which were subsequently adopted, it is because in reality the daily wants of the inhabitants of these edifices did not lend themselves to anything like uniformity. People thought much more in those days of making suitable internal arrangements, with sufficient means of defence, than of showing to passers-by a well-balanced façade. Taste in those days did not consist in seeking after symmetry without either rhyme or reason; but, on the contrary, in giving expression to a variety of wants by the different aspects impressed on buildings. The great hall, the chapel, the lord's lodgings, the kitchen, the defences, the offices, all assumed the exact architectural character which rightly belonged to them . . . Private houses during the Middle Ages, whether occupying a large space or a small, always showed clearly by their external arrangements what were those of the inside. A timber and mortar front was never covered with plaster to look like stone. If porticoes were put up to protect people passing under them, they were made low enough and deep enough to give them actual shelter, at the same time that they admitted of free circulation beneath their arcades. Before thinking of making a fountain merely a point of view, builders in those days considered that it was intended to supply water to all who wanted some. . . The task of the architect of taste was in those days to give everything an appearance conformable to its appropriate destination, and to ornament it or not as he chose, but still in a suitable manner. Architecture did not then lay down the law for employers, but it obeyed them; that is to say, it obeyed as a being of free-will, without constraint, without giving up its principles; and while it put all its resources and its science at the service of those wants which it

was required to meet, it always considered these very wants as the principal and dominant question to which it had to attend."

ARCHITECTURAL AND ARCHÆOLOGICAL SOCIETY OF DURHAM.

The concluding meeting for the session was held on the 29th ult., at Bishop Auckland; the palace being thrown open for inspection.

Mr. W. S. Gibson read an elaborate paper on the history of the castle. By the help of ancient documents he traced the various modifications which the ancient pile had undergone in the course of ages; working in here and there lively pictures of the distinguished men who had from time to time inhabited it, and of the phases of life which had been witnessed within its walls.

After luncheon, in reply to a toast of thanks, proposed by the Rev. Dr. Holden,

The Bishop of Durham said, he felt as every bishop must feel, and as everybody interested in the Church must feel, that an archæological and architectural association like that of which they were members, was a real benefit to society at large. One felt that a great deal of mischief had been done—irreparable mischief had been done—in many of their parish churches, through pure ignorance; and one felt that a society devoted to the special object was not merely enlisting a number of persons who found great interest in the pursuit of a study peculiarly attractive on account of its many historical associations; but was conferring real and lasting benefit on the diocese in which it existed, simply because it was naturally a society to which all would defer with regard to their opinion. He had therefore not the least doubt it would be the means of preserving many an old building in the diocese; preventing many an injury being done to that which a little care might restore to its former beauty; and preventing many unsightly things being reared up by the zeal—the indiscreet zeal of persons who wished to alter but did not know how to alter.

GERMAN (R.C.) CHURCH OF ST. BONIFACE, WHITECHAPEL.

What has been known as Lady Huntingdon's Chapel, in Union-street, near Whitechapel Church, has been fitted up internally under the direction, and to some extent by the hands, of Mr. F. Sang. The old interior was taken out, leaving nothing but the walls and domical ceiling. A sanctuary has been formed. Romanesque columns, set in a circle, form an ambulatory, and carry the dome, which is decorated with painted palm-trees and other forms: lunettes made in the lower part of it are also decorated with paintings. The altar, of Caen stone, is of large dimensions, with a width of 18 feet; the centre, as the altar proper, being 9 feet. An Agnus Dei forms the centre decoration; while the side panels have Romanesque scrolls and angels, with gilded riband ornamentation. There is also a canopy of similar material and workmanship, decorated in gold and colours. A picture of the "Salvator Mundi" fills up a circular panel above; while the background behind the high altar has pictures in fresco of angels administering to the religious rites: the whole ably executed. The builder was Mr. John Nadin; and Mr. T. Nadin, jun., has acted as clerk of the works.

The old common-looking seats, freshly painted, and the equally old and unsightly floor, contrast unpleasantly with the large amount of artistic decoration above. We must suggest, too, that some remedy seems needed for the dampness of the old parts of the building.

THE WEST INDIES.

A correspondent writes,—We are doing very little in the West Indies, in consequence of the depression in the sugar trade. In Antigua we are building a new market-house, and a school chapel, and are about to erect another. At St. Kitt's a memorial school to Archdeacon Pover is about being built. Sanitary improvements are much needed in our West-Indian towns. There are scarcely any with drainage or good water supply, and their other sanitary arrangements are miserably defective; and yet we wonder why yellow fever makes such havoc. If you were to visit them you would be shocked.

The market-place is in form of a parallelogram, the outer area about 22 feet wide, roofed over, and the inner area planted with rows of trees, for shade and ornament. There are public streets all round it; and the building is closed in to the streets, but open to the inside, so as to afford ventilation and plenty of air. The market at the chief town, Barbadoes, is similarly arranged; and I think this kind of arrangement would suit some localities in England and elsewhere. The effect is very good. One side of the covered part is divided into stalls about 8 feet square; up the centre is the promenade; and on the other side are the standings for fruit, vegetables, &c.

The chapel school is Early English in style. The walls are of coursed green stone, with white stone heads and cills to door and windows, and red brick window dressings and buttresses. The plinth is also white stone. The roof is to be covered with blue and red tiles, with ornamental ridge tiles, and terra cotta cross (Blashfield's), and bell gables. It is built on the foundation of the old chapel, destroyed in the earthquake of 1843, and in a picturesque situation. It is great trouble to execute the works, as we have no skilled workmen here, and mechanics are gradually getting worse and worse, as they have no system of apprenticeship. They say it savours too much of slavery.

The school at St. Kitt's is Early English in style, with ornamental blue and white stone walls, and red brick window and door dressings and buttresses. The arches for windows and doors are also to be of coloured bricks, red and black. This, as well as the Antigua chapel school, will have high pitched open roofs, with plenty of ventilation. The foundation of St. Kitt's school was laid by Lady Pine, the wife of the Lieut.-Governor, with great pomp and ceremony. The band of H.M.S. *Immortalité* was in attendance, and played some spirit-stirring airs, much to the satisfaction of the inhabitants, particularly the negroes, who are very fond of music. It is no uncommon thing to see them preceding the bands in the streets, waltzing and curveting in graceful attitudes.

PROPOSED THAMES EMBANKMENT.

The following are the suggestions with reference to this matter which were made to the Government by the Royal Institute of British Architects, before the Act was passed:—

1. *Approach from Embankment to Westminster Bridge.*—That the line of roadway on the Embankment, forming the communication between it and Bridge-street, Westminster, should be so laid out that, at its junction with Bridge-street, its centre should coincide with the centre of the clock tower of the New Palace at Westminster, so that the tower may be fully seen from such line of street centrally, and not on the side of it. That the space between such road and the river be appropriated only to public gardens, without any buildings; and that a promenade, abutting on the river (25 feet wide), be provided. That the space at the Middlesex approach to New Westminster Bridge be symmetrically treated on each side of such approach, having due regard to the line of buildings of the New Palace at Westminster.

2. *New Street opposite the Horse Guards.*—That with reference to the projected new street, from Whitehall Yard to the Embankment, its central line should coincide with that of the Horse Guards, and be at a true right angle to the front thereof, by which means it would be parallel with the end front of the Banqueting House, and afford an opportunity for a new public building, fronting the Horse Guards, designed as a pendant to the Banqueting House, whereby it is submitted that a worthy entrance to the new street leading therefrom to the river would be obtained. It is submitted that no constructural difficulty with reference to existing buildings would ensue from taking this line instead of that shown on the Parliamentary plan; but that, on the contrary, there would be advantages in this respect.

3. *Passage of Embankment Roadway under the Bridges.*—That with reference to the transformation of Hungerford Bridge from a suspension bridge to a railway bridge, some attention in an artistic point of view to the mode of treatment of the said railway bridge is desirable; and that, with reference not only to Hungerford, but all the other bridges under which the Embankment road will pass; such roadway be crossed by an opening not of greater width than the Embankment road, and also so as to leave the opening of a uniform height throughout its span; and further, the piers or abutments of such opening should be designed and treated with due artistic consideration. It is to be remarked that the railway at Hungerford appears to be only 23½ feet above the Embankment road, which is considered rather low, considering that the said road is to be 100 feet wide.

4. *Passage of South-Eastern Railway over the Extension of Whitehall-place.*—That as it appears from the Parliamentary plan and sections that the authorized line of the South-Eastern Railway, after passing over the new Hungerford Bridge, will cross the proposed branch street between Whitehall-place and the Embankment road, at a level of only 19½ feet above such branch road, which would only give a clear headway of 17 feet, which it is submitted is much too little, the levels and gradients of such new branch street should be reconsidered, and more headway, if possible, obtained.

5. *Somerset House: River Front.*—That the effect of the Embankment and road upon the river façade of Somerset House (already rather low in effect) will be seriously prejudicial to that building in an artistic point of view, unless the opportunity is taken to make alterations in the lower stories and present terrace of that building. Two or more terraces successively descending from the level of the present one to the level of the Embankment road would add height and dignity to the edifice as seen from the river and road. Such alterations can be readily made without any interference with the general design of the superstructure; and increased accommodation available for the public service would be thus obtained by new suites of rooms under such terraces, all which rooms would be eligibly situate, and have their windows towards the river. Further accommodation could also be got by extending the wings of the river façade to the new line of the Embankment road.

6. *Embankment Roadway under Waterloo Bridge.*—That the passage of the Embankment road under one of the arches of Waterloo Bridge should be considered in reference to the suggestion in Article 3.

7. *New Street through the Savoy to Somerset House.*—That with reference to the new street from the Embankment to Somerset House, which traverses the Savoy, the axis of such street should be modified from that shown on the Parliamentary plan; and, if necessary, slightly curved, so that it may approach the front of Somerset House, in Wellington-street, centrally with such front. That the recessed area in front of Lancaster-place, and that in front of Somerset House, should be laid out and designed as a public square, whereby the entrance and façade of Somerset House would assume more fitting importance. That the only difficulty in carrying out this altered line would be the German Lutheran Church, in the Savoy, which must be pulled down; but, inasmuch as this is an inexpensive brick edifice, with no pretensions either as regards appearance or associations, and as other sites adjacent and resulting from the street improvements will be readily available, such difficulty is of no importance. It may be remarked that as, according to the Parliamentary plan, the new roadway would be carried on a viaduct, 22 feet high, close adjoining the Lutheran Church, it would probably in any case be desirable, if not necessary, to remove it.

8. *Viaduct at Blackfriars Bridge.*—That with respect to the proposed viaduct on which it is intended to carry the Embankment road past the City Gasworks to Bridge-street, Blackfriars, it must be noted that the greatest height of such viaduct will be no less than about 35 feet above low-water; and that, considering its consequent bulk and importance, its design as seen from the river deserves careful and artistic consideration, since it may either be an ornament to the river, or a discredit to the Embankment scheme. That, consequently, the Institute recommends special control over the design to be retained in the hands of the Government.

9. *New Street approaching the Mansion House.* That with respect to the proposed new street from the Embankment to the Mansion House, attention should be given to the fact that the authorized line of the London, Chatham, and Dover Railway (even when raised as proposed by the Embankment Bill) will be only 19 feet above the new street, the width of which is proposed to be 70 feet; and that the clear headway would be only 17 feet, which is very insufficient; that such headway can be improved by altering the level of the approach to the bridge, which is quite feasible, and would be a great improvement in many ways; further, that, considering the angle formed by the junction of the new street with Bridge-street, it would be desirable to rearrange Chatham-place in the form of a circus, that being the only form on plan which will permit such junctions with good effect.

10. *New Blackfriars Bridge.*—That as Blackfriars Bridge is about to be rebuilt, either in conjunction with, or close adjacent to, the railway bridge of the London, Chatham, and Dover Railway, the designs of both those structures should

comprise a suitable and effective land archway crossing the Embankment road.

11. *New Street to St. Paul's Cathedral.*—That the present occasion should be taken to form a new street from that which is to lead to the Mansion House, and that shall be central with, and afford a view of, the south transept and dome of St. Paul's (so far as the powers of the Embankment Bill will allow), such street to be extended at a future time, as shown on the plan by dotted lines.

12. *Approach towards the Royal Exchange.*—That the axis of the new street leading to the Mansion House should be slightly altered, as shown by the red line, so as to approach the Royal Exchange centrally with its portico; and that, at the junction of the new street with the Poultry, a half circus should be formed, to provide for the excessive and increasing traffic at this point.

13. *Powers to private Owners to aid in Improvements.*—That permissive powers might be given in the Bill to private owners of property along the line of the street improvements to use the provisions and enactments of the Lands Clauses Acts in relation to their property, whether on lease, or otherwise held, and which property might be dealt with or advantageously altered, to accord with or assist projected or desirable improvements; and that local or district boards might be empowered to aid in carrying out such improvements.

14. *New Site for York Gate.*—That care should be taken to preserve the river-side gateway at the end of Buckingham-street, known as "York Gate," it being an architectural monument worthy of careful preservation.

15. *Landing Stages for Steamboats, &c.*—That special provision should be made in the Bill for convenient landing-stages at numerous points, and so contrived as to rise and fall with the tide, and be recessed within the line of the Embankment; and, consequently, not to interfere with the waterway; thereby dispensing with all piers or barges for landing projecting (as at present) into the stream.

16. *Junctions at Angles of Old and New Streets.* That it be an enactment of the Bill that all junctions to be made between old and new streets under its powers should be laid out and formed so that, whenever the lines of the streets forming such junction would not include an angle of 120 degrees; so much ground shall be thrown into the new street at such junction as shall give such ground a length of at least 25 feet, measured at an obtuse angle of 135 degrees; and that such area shall be paved as a foot-pavement for a width of at least 10 feet.

17. *Control on Artistic Questions to be with Government.*—That some control over all such points in the projected improvements as involve any artistic considerations, or treatment of existing or intended buildings, shall be retained in the hands of the Government, through the veto of the First Commissioner of Works, on the plans or proposals relating to the same.

18. *Stone Facing to Embankment Wall.*—That the face of the intended river wall should be formed of granite or other stone, and not of iron piling and sheeting, as has been suggested in several of the plans submitted to the Commissioners.

19. *Site for a Statue near Waterloo Bridge.*—That the triangular piece of ground which will result from the junction of the proposed new street with Wellington-street be preserved free from all buildings, and might be appropriated to a statue, or some similar public monument.

20. *Churches or Architectural Monuments to be Preserved and rendered Visible.*—That it be a provision of the Bill, that whenever the lines of the new streets pass close to, or render visible, any existing churches or public monuments, it be forbidden to erect any buildings on such intervening ground as shall obstruct the view of such churches or public monuments from such new streets.

21. *Uniformity in Façades and Heights of New Houses.*—That some provision be made in the Bill to insure the blocks of buildings along the new lines of streets being treated with some attention to architectural unity; and that the height of all new buildings on these lines be restricted to 70 feet from the level of the street to the wall-plates or springing of the roofs.

22. *Widening of Part of Queen-street, Cheapside.*—That it would be a most useful improvement to widen that small portion of Queen-street which will lie between Cannon-street and the proposed new street, as shown by dotted red lines on the plan.

This report was forwarded by the President to the Right Honourable W. Cowper, with a resolution of the Council to the following effect, viz.:—

"That the Royal Institute of British Architects assumes thereby no responsibility in recommending, or otherwise, the general principles or lines of Embankment laid down by the Thames Embankment Commissioners; but limits its functions strictly to offering such suggestions as may, they conceive, improve, without invalidating the scheme for which the professional advisers of the Right Honourable the First Commissioner must be obviously and most properly held responsible."

THE DAVY MONUMENT AT PENZANCE.

It has often been a matter of surprise that no monument has been erected to the memory of Sir Humphry Davy; that one so eminent in science, and so much esteemed for discoveries that have benefited his country and the world, should have been left so long—now upwards of thirty years since his death—without any public memorial. To remedy this neglect, the working men of Penzance, Cornwall (to their honour be it said), resolved that a monument of some sort should be erected on a hill near that town, which claims to be the birth-place of the philosopher; and, like working men, they commenced in good earnest, and carried the project through. The site has been given by Mr. J. J. Rogers, M.P., and is situate on the north of the Mount's Bay, rising some 200 feet above the level of the sea, and just opposite the venerable St. Michael's Mount, with its castled apex, commanding a sea horizon of more than twenty points of the compass, and an uninterrupted land view on all sides of some twenty miles radius.

In December last, the committee advertised in the *Builder* for a column surmounted with a statue, stating that all architects disposed to present designs for a monument to Sir H. Davy should forward them to the secretaries. This advertisement offered no remuneration for the best or any other design; and in every case where information was applied for by any architect, it was given; and, at the same time, each was informed that he might forward any design his fancy might lead him to suggest. Eleven designs were received; and at a committee meeting, at which nineteen members were present, the various designs were subjected to sharp scrutiny and warm discussion, when four out of the number were selected, from which the final selection was to be made by ballot, viz.: two by Mr. Ezard, of Bath; one by Mr. Brown, of London; and one by Messrs. Salter & Perrow, of Westminster. The result of the ballot showed nine for Salter & Perrow, three for Ezard, and two for Brown. Five members did not vote.

Messrs. Salter & Perrow had sent in two designs; one for a column and the other for a tower. The tower having been objected to by some members of the committee, as not being strictly in accordance with the advertisement, was not admitted to the competition. The ballot was taken on their column, and the column chosen.

It having been one of the conditions upon which Mr. Rogers granted the site that the design should be submitted to him for approval, a deputation from the committee waited on Mr. Rogers with both the designs of Messrs. Salter and Perrow. After a careful inspection of both column and tower, that gentleman expressed his approval of the column, and said that he would not offer any obstacle if that were the committee's fixed choice, but if his opinion were asked he should prefer the tower. On the report of the deputation at the next committee meeting on the result of the conference with Mr. Rogers, seventeen members were present, and after a discussion on the advantages of the tower over the column, it was resolved that the tower should be adopted.

Our illustration, then, shows the tower thus proposed to be erected at Penzance to the memory of Sir H. Davy. The structure is to be built of Cornish granite and bands of serpentine. The sides at the base are to receive suitable inscriptions and heraldic devices. The staircase will be lighted as shown by the winding lights on all the four sides; and at the top, immediately under the cornice in each side, a window is to be formed for a "look-out." On the angles of the parapet it is proposed to fix models of emblems characteristic of Davy's discoveries; viz., the Davy lamp, a Leyden jar, a gas-receiver, and a galvanic battery. From the summit a magnificent view is obtained—the unrivalled Mount's Bay, with its "emerald gem set in the silvery sheen;" mercantile marine studding its bosom; ships of all nations and kinds ploughing their silent course across the great highway of the world; the ancient Cornish town, with its busy harbour below; the distant hills; the beautiful valleys, with woodland and coppice; suburban villas peering their heads between.

"The look-out" the lovers of astronomy are hoping will be provided with a good telescope, globes, astronomical maps, and other instruments for making and recording observations.

The committee are now zealously at work raising subscriptions in their own more immediate neighbourhood; and it is their intention to make their appeal as wide as possible. A London committee is now in the course of formation, and it is to be hoped the requisite funds will soon be provided.

The Mayor of Penzance is the chairman of the Cornish committee, and all sums transmitted to him will be duly acknowledged.

"PATENT STONE."

Mr. Charles M. Westmacott has sent us two specimens of an artificial stone, for which he has taken a patent. He describes the stone as being composed solely of lime, sand, carbonic acid, and water. For one of the fragments "white pit or silver sand" was used; and it was made and pressed with about five tons to the square inch a fortnight ago. The body of the other piece is composed of calcined river sand, and a larger proportion of it is used than in the first. It is faced with silver sand, and was pressed with about four tons to the square inch. Both the specimens are very hard, but what pressure they would sustain we have not been able to try. The cost of its manufacture, the patentee says, can be estimated from the fact, that the materials of which it is composed are cheaper than those used in the composition of mortar. "With limestone, a limekiln, and sand, as much as would be required could be produced of any size at about the price of good bricks."

This seems to approximate to M. Coignet's *Béton aggloméré*, which we have more than once described.*

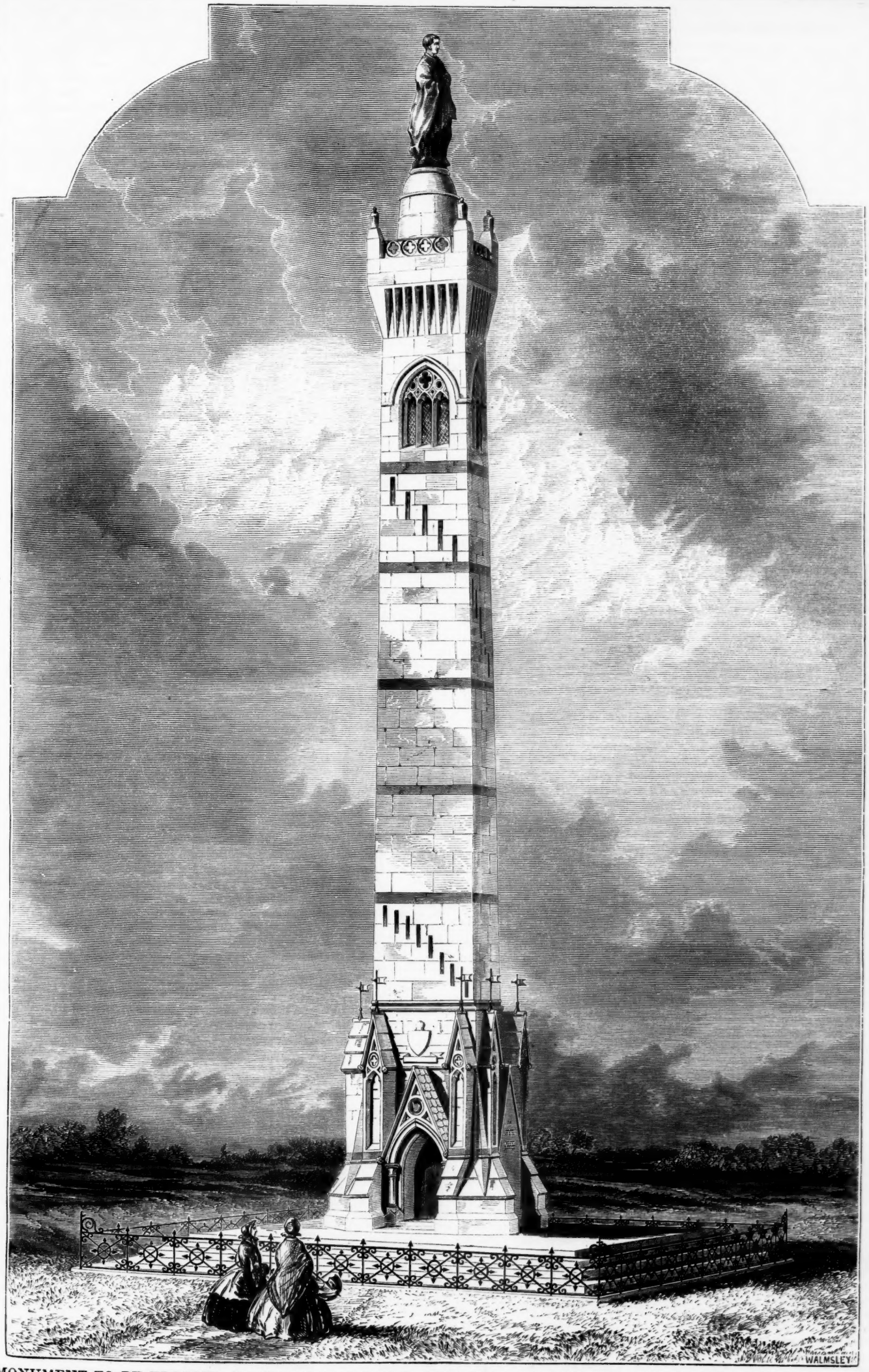
In the "Reading" stone, our readers will recollect, pieces of brick or stone, gravel, &c., are introduced; the shape being given by the mixed sand and lime "punned in" by hand.

We have been favoured by Mr. J. W. Sumner, of Wray-park, in this town, says the *Surrey Standard*, with the inspection of some specimens of bricks made without burning, from refuse material, such as gravel, sand, clinkers, chalk, &c., but possessing all the qualities required. These and ornamental moulded bricks can be made in this way ready for use in a few hours, even in frosty weather. The price will be such as to command a great sale. When it is considered, adds our authority, that the material created by excavating a cellar or basement can be made on the spot into bricks, and thus raise a house, the results need not be doubted. A patent is taken for the United Kingdom, France, Belgium, Austria &c., &c.

Mr. W. J. Bennett has patented a solution to be used with Portland and other cements for the production of artificial stone, or for building purposes. Here the main object is to expedite the setting of the cement, and thus to permit of the speedy removal of the casts from the moulds. This the patentee effects by introducing into the water, used to saturate the cement and bring it to a plastic state ready for moulding, a fluid compound consisting of a solution of carbonate of soda, or its equivalent, with sal ammoniac and alum.

Messrs. O. & J. Kerautret's patent for the "Ornamentation of Buildings," although not very clearly described to us, seems to involve the use of lime and sand, or cement, as an exposed material in building. It consists, as they say, in moulding, in the position they are to occupy, all the architectural forms to be given to the building under construction. For this purpose the patentees use ordinary rough unhewn stone, which they bind together with good cement mixed with a proportionate quantity of sand, according to the finish or durability required. They apply the invention to ordinary apertures—a door or window, for example—by placing in proper position boards bound together by screw bars; these boards forming in hollow or projection all the angles of the aperture. They then set the masonry in these boards, taking care to press the cement well against the wood, in order to penetrate into the angles, which must eventually form the ridges or sharp edges. They lay all the stones in a bed of mortar, and proceed in like manner with the lintel or the arch, placing the stone in the direction of the curve. The cement being set, they unscrew and remove the wooden framing, leaving an aperture of the form required.

* See, most recently, p. 597, *ante*.



MONUMENT TO BE ERECTED ON LESKUDJACK HILL, PENZANCE, TO THE MEMORY OF SIR HUMPHRY DAVY.

MESSRS. SALTER & PERROW, ARCHITECTS.

THE ORDNANCE SURVEY.

A vast sum has been already spent, and large amounts continue to be expended, upon this survey, but with very unsatisfactory results. We have long heard complaints; and letters which have been recently published show how great is the need for improvement in the management of it.

As it is managed at present, maps of particular counties are issued which are quite useless in consequence of the omission of railways, towns, and the want of attention to other important alterations. We know the difficulty there is in keeping maps and plans of districts and towns up to the mark: the expense, for instance, year by year, of correcting a map of London is very great, in proportion to the size; but this must be done, or the production would be almost worthless. In connexion with the ordnance survey we find a beginning made of a particular district, and then others are proceeded with, and before the national work has been half completed, the first maps have become antiquities.

There is a staff of engravers and draughtsmen constantly engaged upon this work, and the expense could be easily estimated for each five or ten years. At present this staff seems to be insufficient for the extent of work, and in order to produce a satisfactory result it must be much increased; but what seems to be particularly needed is more simultaneous action: we want an entire and correct map of England at a particular date? Why should we not have a corrected ordnance map of England produced every ten years, which might appear at the same time as the census reports? Supposing that a large number of draughtsmen and engravers were employed during one year or a year and a half, instead of a smaller number throughout ten years, the matter desired could be easily effected. We do not apprehend that there would be any difficulty in obtaining a sufficient supply of skilful hands; and it is worth consideration, if it is necessary for the work to be done in a public office. In London, Edinburgh, and the chief provincial towns, there are map engravers quite qualified by their skill and experience to complete this work with success, and they could likewise be depended upon for the performance of a certain amount of engraving in a stated time.

As regards uniformity, there would not be any risk of failing in producing this with a proper amount of management; but, however it may be managed, we want a map of England of the date 1861, 1871, 1891, &c., &c., which should be thoroughly perfect and correct up to within two or three months of that publication.

The large scale map can perhaps never be carried out in this way, and perhaps it is not quite so necessary; for persons connected with particular localities will find it to their interest to mark in such alterations as concern them by hand; but as regards the small scale, by right and vigorous management it may be completed at particular periods, and the whole expense need not be very much greater than it is at present.

MR. GROGNET, ARCHITECT.

We have to record the death, at a very advanced age, of Mr. George Grognet, architect, who had devoted the best portion of his time to the cultivation of arts and sciences in the island of Malta. A pension of 100*l.* per annum was conferred upon him on the occasion of the Prince of Wales's visit to Malta, as a public recognition of his distinguished merits.

METROPOLITAN BOARD OF WORKS.

The first sitting of this Board after the recess was held on the 26th ult., at the offices of the Board, Spring-gardens; Mr. John Thwaites, the chairman, presiding.

Western Division Drainage Works.

The tenders submitted for the construction of the above works were opened. They were as follows:—Messrs. Ritson & Ridley, 65,000*l.*; Mr. Marriott, 57,000*l.*; Mr. W. Dethick, 63,861*l.*; Mr. Edward Thirst, 57,900*l.*; Mr. Joseph Diggle, 66,708*l.*; Messrs. Hill & Co., 60,890*l.*; Messrs. W. Moxon & Co., 56,740*l.*; and Mr. John W. Sawyer, 59,927*l.* The tender of Messrs. W. Moxon & Co. was accepted.

Assessment of Property in the Metropolis.

The Financial Committee submitted for approval a statement showing the annual value of the property in the city of London and other parts of the metropolis, estimated according to the estimate or basis on which the county rate was assessed, or according to a like estimate, together with the sums to be assessed thereon in respect to the main drainage rate of 3d. in the pound 1862-63, and recommended that precepts for such rate be sealed and issued. The following is the assessment:—

	Annual Value of Property.	Metropolis Main Drainage Rate of 3d. in the Pound. Sums to be assessed.
	£	£ s. d.
City of London	1,319,961	16,499 10 3
St. Marylebone	976,820	12,210 5 0
St. Pancras	800,640	10,008 0 0
St. George, Hanover-square	943,696	11,796 4 0
Lambeth	637,000	7,962 10 0
St. Mary, Islington	548,572	6,857 3 0
St. Leonards, Shoreditch	265,772	3,322 3 0
Paddington	526,420	6,580 5 0
St. Matthew, Bethnal-green	130,320	1,629 0 0
St. Mary, Newington, Surrey	240,000	3,000 0 0
Camberwell	250,000	3,125 0 0
St. James, Westminster	431,500	5393 15 0
St. James and St. John, Camberwell	221,372	2,767 3 0
Chelsea	234,248	2,928 2 0
St. Mary Abbott's, Kensington	319,924	3,999 1 0
St. Luke, Middlesex	171,564	2,144 11 0
St. George-the-Martyr, Southwark	146,000	1,825 0 0
Bermondsey	150,000	1,875 0 0
St. George-in-the-East	170,479	2,130 19 9
St. Martin-in-the-Fields	258,708	3,233 17 0
Hamlet of Mile-end Old Town	162,388	2,029 17 0
Woolwich	83,000	1,037 10 0
Rotherhithe	83,500	1,043 15 0
St. John, Hampstead	104,156	1,301 19 0
Whitechapel district — including St. Mary, Whitechapel, Christ Church, Spitalfields, St. Botolph Without, Aldgate, Holy Trinity, Minories, Precinct of St. Katharine, Hamlet of Mile-end New Town, Liberty of Norton Folgate, Old Artillery Ground, and district of the Tower	252,669	3,158 7 3
Westminster district, including St. Margaret and St. John the Evangelist	274,500	3,431 5 0
Greenwich district, including Saint Paul, Deptford, and Hatcham, St. Nicholas, Deptford, and Greenwich	260,300	3,253 15 0
Wandsworth district, including Clapham, Tooting, Graveney, Streatham, St. Mary, Battersea (excluding Penge), Wandsworth, and Putney (including Roehampton)	361,400	4,517 10 0
Hackney district, including Hackney and St. Mary, Stoke Newington	294,440	3,680 10 0
St. Giles district, including St. Giles-in-the-Fields, and St. George, Bloomsbury	261,696	3,271 4 0
Holborn district, including St. Andrew, Holborn-above-Bars, St. George-the-Martyr, St. Sepulchre, in the county of Middlesex, Saffron-hill, Hatton-garden, Ely-rents, Ely-place (except that part rated by the Commissioners of Sewers for the city of London) and Liberty of Glasshouse-yard (except that part rated by the Commissioners of Sewers for the City of London)	171,643	2,145 10 9
Strand district, including St. Anne, Soho, St. Paul, Covent Garden, St. John the Baptist, Savoy, or Precinct of the Savoy, St. Mary-le-Strand, St. Clement Danes, and the Liberty of the Rolls	268,348	3,354 7 0
Fulham district, St. Peter and St. Paul, Hammersmith, and Fulham	133,720	1,671 10 0
Limehouse district, including St. Anne, Limehouse, St. John, Wapping, St. Paul, Shadwell, and the Hamlet of Radcliff	177,663	2,220 15 9
Poplar district — All Saints', Poplar, St. Mary, Stratford-le-Bow, and St. Leonard's, Bromley	272,504	3,406 6 0
St. Saviour's district—Christ-Church and St. Saviour (including the Liberty of the Clink)	164,000	2,050 0 0
Plumstead district — Charlton (next Woolwich), Plumstead, Eltham, Lee, and Kidbrooke	142,230	1,777 17 6
Lewisham district—Lewisham (including Sydenham Chapelry and Hamlet of Penge)	184,100	2,301 5 0
St, Olave district—St. Olave, St. Thomas, Southwark, and St. John, Horselydown	99,700	1,246 5 0
The Charter House	1,948	24 7 0
Gray's Inn	12,676	158 9 0
The Close of the Collegiate Church of St. Peter	1,420	17 15 0
Inner Temple	20,236	252 19 0
Middle Temple	13,000	162 10 0
Lincoln's Inn	16,420	205 5 0
Staple Inn	2,152	26 18 0
Furnival's Inn	3,164	39 11 0
Making a total of	£ 12,565,969	157,074 12 3

The statement was adopted, and the precepts ordered to be issued to the various parishes.

SCHOOL-BUILDING NEWS.

Tamworth.—A few years ago, Sir Robert Peel was mainly instrumental in the erection of a new church: last year he instituted the Fazeley Club, or Reading Room and Library; and he has just added another to the list of benefits by handing over to the churchwardens a new school-house which he has caused to be erected. The building was commenced early in the present year, on a plot of ground contiguous to the church, and standing near to the parsonage and the village reading-room. It is from the plans of Prof. Chamberlain, of Birmingham, and has been built by Mr. C. Clarson, of Tamworth, at a cost of about 1,400*l.*, which has been entirely defrayed by Sir Robert, with the exception of the usual grant from the Committee of Council. The bricks were made by Mr. G. Skey, and were furnished by him at cost price. The schools are built to accommodate 240 children, viz., 110 boys and girls, and 130 infants; and if, in addition to these, the Sunday school children are counted, the total number provided for will be above 400.

Sedgley.—The memorial stone of the Ragged School and Temperance Hall, now in course of erection opposite the Mill House, High-street, has been laid by Mrs. Tinsley. The cost of the school, &c. is 1,000*l.* The ground cost about 300*l.* Mr. Bourne, of Dudley, is the architect. The school will be 51 feet by 29, and the lecture-hall 66 feet by 29. There will also be refreshment rooms, library, and reading rooms.

Blackley.—The Barnes Green Church School, Blackley, has been opened, according to the *Manchester Courier*. The schools and master's house are of Tudor design, and are built of red brick, with white brick facings. The school is 45 feet long by 20 feet wide, and has a roof part open timber stained; the class-room 20 feet by 10 feet. The school is lighted with five windows in the length, and two large Gothic windows in the north gable, the north end being surmounted by a bell turret. The cost of the school and fitting is nearly 800*l.*, exclusive of the land. The honorary architect was Mr. Dale, one of the wardens of St. Peter's, Blackley, with which the schools are in immediate connexion. The contractors were Messrs. Statham & Sons, Pendleton.

PROVINCIAL NEWS.

Bury.—The scaffolding is now removed from the portico of the New Corn Exchange; the façade being completed, except the steps, and the carving of the group in the pediment and the arms over the doors.

Hereford.—The movement in behalf of the improvement of the music-room at the Shirehall is making progress under the auspices of a committee of gentlemen, including the High Sheriff and the Archdeacon of Hereford. The estimated cost of the work necessary to convert the inconvenient music-room into a room useful for public purposes is about 1,200*l.*,—according to the local *Times*;—towards which sum the donations and guarantees, including the cost of ventilation, &c., which will be borne by the county, now amount to between 900*l.* and 1,000*l.*, leaving a deficiency of about 200*l.* By the plans of Mr. Chick, the room will be restored to its original form by the removal of the orchestra to a shell-like apse, which will be added to the north-east side of the room. On a level with the orchestra will be a retiring-room for performers; and underneath the orchestra will be other rooms, available as hat and cloak rooms, retiring-rooms, kitchen for the preparation of public dinners, &c. A staircase will provide additional means of egress.

Stockport.—The new Mechanics' Institution at Stockport has been publicly inaugurated by a *soirée* in the lecture-hall, at which Lord Stanley was present. The new building is of brick, with stone facings. The cost has been about 5,000*l.* Class-rooms, library, committee-rooms, &c., have been provided, and a lecture-hall, with orchestra and gallery. Nearly 1,000 persons can be accommodated.

Newcastle-upon-Tyne.—The Newcastle Savings Bank, on the line of the new street from Grainger-street to the Central Station, is approaching completion. The entrance for depositors is at the south or Westgate-street entrance of the building, by an entrance-hall 24 feet by 16 feet. Adjoining is a waiting-room, 17 feet by 16 feet 6 inches. On the other side of the hall are the actuary's and private offices; and above these, approached by a stone staircase, is the directors' room, 28 feet by 24 feet, and secretary's office, 20 feet by 17 feet. From the entrance-hall there are two entrances into the bank—one for the present depositors, the

other for new depositors requiring books, and into the clerks' and actuary's offices. The bank is a hall, 85 feet by 36 feet, carried up the full height of the building, and intended to be divided into different business compartments, for clerks, actuary, directors, cashiers, &c., by screens 12 feet high, formed of pilasters, moulded caps, and entablature. The upper parts of these screens are entirely filled in with polished plate-glass, so that any one can command a view of the whole business, and, at the same time, they will not destroy the effect of the interior. The bottom story windows are also of polished plate-glass; and, to prevent too much glare of light, the upper windows are glazed with ornamental stained glass, with blue borders and ruby coloured tops and rosettes, all ornamented to suit the style of the building. The upper and lower windows have the appearance of only one window in the interior, being connected and continued with a moulding the full height, and the interval formed into a simple moulded panel. There is a polished stone dado, 4 feet 6 inches high, round the interior, with moulded base, stringing, &c.; and in it are formed, with pilasters, caps, &c., ornamental circular stone fireplaces, with carved keystones. The ceiling is divided into compartments by the beams, which are curved at the bottom, and constructed so that the circular parts are formed into flues for ventilation. These compartments are divided into panels, moulded and ornamented. The circular parts of the beams are supported by pilasters, caps, carved trusses, &c., having one between each window. The exterior is built entirely of polished freestone. The first story is carried up with rusticated and chamfered pillars, the windows being recessed and arched, with moulded panels below, having cornice, balustrade, panels, &c. The upper story has a pediment above the Westgate-street entrance; also in the centre of the east elevation, supported on double columns of the Roman Ionic order, with entablature and moulded pedestals, and open balustrade above. The upper windows have moulded imposts, archivolts, consoles, and sunk panels in the spandrils. The design is by Mr. John E. Watson, of this town, architect, who gained the first premium of 50*l.* in competition; and it has been carried out from his details and under his superintendence. The contractors are Mr. W. Gibson, for masons' and carpenters' work; Mr. Beck, slaters' work; Messrs. J. Glaholm & Sons, plumbers' work; Messrs. W. B. Wilkinson & Co., plasterers' work; Mr. R. Lawson, painters' and glaziers' work; and Mr. W. H. Barnett, of the Victoria Works, stained glass. Mr. G. Machell, clerk of works. The wood carving has been done by Mr. G. Jobson; and the stone carving by Mr. J. Patterson, who is now engaged carving the arms for the pediments. The shutters are self-acting and revolving, by Messrs. Clark & Co., of London. The total cost is about 10,000*l.* Dr. Gibbs' house, adjacent, is also by the same architect; and the new County Courts are to be erected on the site between this and the Assembly Rooms.

Tynemouth.—According to the design recently adopted by the River Tyne Improvement Commissioners the piers at the mouth of the river are to be extended to 30 feet at low water. The north pier will then be 1,000 yards in length, and the south pier nearly a mile (5,000 feet). The width between the pier heads will be 1,100 feet.

Hawick.—Improvements here are progressing. Old houses are being pulled down, and new ones are rising in their place. Mr. Dalgleish, of the *Hawick Advertiser*, has reared a high freestone edifice on the south side of the Market-place. The Tower Inn has been both enlarged and improved in aspect. But the chief addition to the domestic architecture of the town is the new mansion of the Rev. John Thomson, St. Mary's. It is built on a high terrace adjoining Ladylaw. Another mansion is also being built on the Wilton side. It commands a panoramic view all down Teviotdale.

CHURCH-BUILDING NEWS.

Hautbois Magna.—The first stone of the new church about to be erected in the village of Hautbois Magna, about seven miles from Norwich, has been laid by Lord Suffield, who is lord of the manor. The site is on a plateau immediately below the Parsonage-house, and within view of the old ruined church, the river Bure flowing between. The new church will accommodate 200. It will be built of flint, with stone dressings, and will consist of a nave, two aisles, and a chancel, lighted by lancet windows, and with a bell-turret over the chancel arch, and a porch at the south-west corner. The style will be Gothic, of the thirteenth century period. The interior of the roof will be waggon-headed, with coloured panels; and the floor will be level throughout, and paved with Minton's and Staffordshire tiles. There will be no pews, but chairs. The cost of building is estimated at 800*l.* or 900*l.* The site was given by the rector. Mr. Jeckyll, of Norwich, is the architect. As some anxiety has been expressed with respect to the preservation of the old church, we may state that the chancel has been repaired, and will be used as a mortuary chapel, and that the walls have been concreted so as to preserve them from decay. All that has been done has been to remove the roof of the nave.

Colchester.—The chief stone of the new memorial church of St. John has been laid on a site where the Ipswich road is met by the lane from Parson's-heath, presented for a church and parsonage by the Countess Cowper. The chancel of the new church will be a memorial of the late Rev. James Thomas Round, B.D., and rural dean, for nine years rector of All Saints', Colchester, and formerly a fellow of Balliol College, Oxford. For the building the church it was originally estimated about 1,800*l.* would be required, for the parsonage 900*l.*, besides general expenses 300*l.*: making a total of 3,000*l.* The district will form a new parish, by the New Parishes Act. The church, which is in the Pointed style, will be built of red brick and grey stocks with stone dressings, red bands inside and black bands outside. The interior of the building is 48 feet long by 21 feet wide; the roof, part open wood work and part lath and plaster; the chancel and aisle paved with encaustic tiles, and lighted with windows of cathedral glass. The edifice will have a wooden spire with bell turret 50 feet high. The sitting accommodation will be for 150 persons. The builders are Mr. G. Crow and Mr. Bremer.

Leicester.—The large body of Wesleyan Methodists in this town, says the *Leicester Advertiser*, have resolved to erect a new chapel at the corner of a newly-projected street on the site of the old cricket-ground, running on to the Humberstone-road, opposite Morledge-street. The ceremony of laying the corner-stone took place on Wednesday in last week. Mr. Ordish is the architect, and Messrs. Clifton & Porter are the builders, at the contract price of 2,000*l.*, and the ground has cost about 700*l.*

Newbury.—A new church is about to be erected at Newbury, in Berkshire, by Mr. Perkins, builder, of that town, from designs of Mr. Scargill, of Colchester.

Achurch.—The church of Achurch, near Thrapston, has now been restored. The church is in the Early Decorated style. The chancel was first finished. The whole work has now been carried out, under the superintendence of Mr. Slater, of London. The builder was Mr. W. Parker, of Thrapston. The chancel, which was much dilapidated, has been completely restored, the pavement being composed of Minton's tiles. The nave and north and south transepts have been almost entirely rebuilt, with an open oak roof. This being now the parish church of Lilford, as well as of Achurch, there was not sufficient room in the old church for the whole of the parishioners; and to remedy this, a new north aisle has been built, providing accommodation for the whole of the congregation. A new wainscot oak pulpit, and open reading desk, the work of Mr. Parker, have been substituted for the old desks. The pulpit is placed on a Ketton stone base, with steps. The addition of the aisle necessitated the taking down of the north wall, and the substitution of columns and arches. The church has been entirely repewed with open oak seats with moulded top rails. The ringers, who used to be on the ground floor, are placed a stage above, and the ground floor is converted into a vestry, approached from the church by a stone screen. A small stained glass window has been placed at the west end; the glass, which was manufactured by Messrs. Clapton & Bell, of London, being presented by Mr. Slater, the architect; the stone work being the gratuitous work of Mr. Parker.

Bromsgrove.—The new Roman Catholic chapel, dedicated to St. Peter, and situate on the Worcester-road, adjoining the town of Bromsgrove, intended to replace that at Grafton on the demise of the present minister of the latter, has just been formally opened. The edifice, however, has been used for divine worship upwards of two years, though not fully completed. It is in the Decorated style. The building is oblong, with apsidal east end; porch towards the N.W.; and vestry N.E. There is a gallery at the west end for a choir; an open roof; and windows of two and three lights. Stone for the work was procured in the neighbourhood. Accommodation is provided for between 300 and 400 persons. Adjoining the chapel is a school (affording accommodation for about 150 children), as also an abode for the clergyman. The architect was Mr. Blount, of London; and the builder, Mr. Wilson, of Birmingham.

Portobello (*Staffordshire*).—The foundation-stone of a new Wesleyan chapel intended to be erected at this place has been laid. The site selected is at the corner of New-street, on the Wolverhampton-road, not far distant from the old Wesleyan place of worship, which has been so much damaged by the workings of the adjacent mines as to be unfit for further use; hence the present erection. The chapel will be a plain brick structure, in the Doric style, to seat about 250 persons. It will be 40 feet in length, 30 feet in width, and 15 feet in height. It will be fitted with stalls instead of pews, in order to allow of its being used during the week as a school-room. The total cost of the building, including the land, will be about 450*l.* The builders are Messrs. Taylor & Hall, of Willenhall, by whom the plans for the building have also been prepared.

Bristol.—The workmen have concluded their operations on the upper portion of St. Stephen's tower, which have occupied upwards of two years and a half, and the scaffolding is being removed. The portion of the steeple of St. John the Baptist church, which was taken down in consequence of its decayed and insecure state, is being re-erected.

Dowlish Wake (*Somerset*).—The church here has been almost entirely rebuilt. The style of the old structure has been altered from the Perpendicular to the Late Decorated. The nave at the west end has been lengthened about one-half. The old high pews have been replaced by low open seats of oak. The roof, which is of stained Memel, and open timbered, is supported by carved stone corbels. There are stained-glass windows, the work of Mr. T. Wells, of Pimlico. The subjects are the principal events in our Saviour's life. The chancel window, a three-light, represents the Crucifixion; the east window of the chapel, a three-light, the Ascension; the south window of the chancel, a two-light, our Lord's Baptism and the Lord's Supper, as illustrations of the two sacraments; the north window of the chapel, a two-light, the Sacrifice of Isaac, and the Brazen Serpent; the western nave, a four-light, eight events in our Lord's life; and the western aisle, a three-light, the Resurrection. In the rebuilding, stone from the neighbourhood has been used with Hambdon Hill dressings. The floors of the tower and chancel are inlaid with tiles. The interior walls are decorated with texts of Scripture, by Mrs. Beaumont, of Wake Hill.

Neath (*South Wales*).—The new Welsh Baptist chapel here, under the contract of Mr. J. D. Rees, is proceeding towards completion.

Chester.—The foundation-stone of a new Roman Catholic Chapel has been laid in Chester. The chapel is dedicated to St. Francis, and the site is in Grosvenor-street. The building is to be 110 feet long, 50 feet wide, and 70 feet high to the top of the ridge. It is to be covered by a roof with one span, and is to contain 800 persons. The estimated cost is 2,000*l.* The architect is Mr. B. Bucknall.

Reddish (*Lancashire*).—The chief stone of St. Mary's Church, Reddish, has been laid. The edifice, which is dedicated to St. Mary, is being built entirely of stone, in the Early Geometric style, somewhat Continentalized in its details, and will consist merely of a nave and chancel. A children's aisle and a chamber for the organ will be placed on either side of the chancel, communicating therewith internally by stone archways. The vestry will be at the east end of the organ-chamber, and will have a door into the chancel. The nave internally will be about 23 yards long by 8 yards wide, and 11 yards high up to the point of the roof. The total length of the church internally will be about 29 yards. The tower will be placed at the south-west or farthest corner of the nave, resting on stone archways internally, which will be supported on a large circular stone column, with an ornamental base and a carved capital. The main entrance will be under the tower. The roofs will have a covering of red Staffordshire tiles, laid in different patterns, and an ornamental crest will be fixed on the ridges or tops. Internally the church will show an open-timbered roofed nave or room, with a centre aisle having pews on either side a similar chancel completing the view; the latter being separated from the former by a large stone pointed arch, resting on carved corbels. All the roofs will be stained a dark tint, together with all the pews and other fittings, to imitate old oak. All the seats of the church will be plain open

benches, with the ends cut to a form; and all the walls and parts between the spars of the roofs will be plastered. A large window will terminate the inside view of the church, and relieve the end of the chancel. The church will be calculated to accommodate 400 persons, including the free sittings. The architects are Messrs. Shellard & Brown, of Manchester; the builders, Messrs. J. & J. Longson, of this town; and the clerk of works is Mr. Samuel Drinkwater, of Oldham.

Kingston, Surrey.—For some short time past a chapel has been in course of erection in the St. James's-road, Kingston. This new building is intended for the use of the Methodists. The architect is Mr. W. W. Pocock.

ALBERT MEMORIALS.

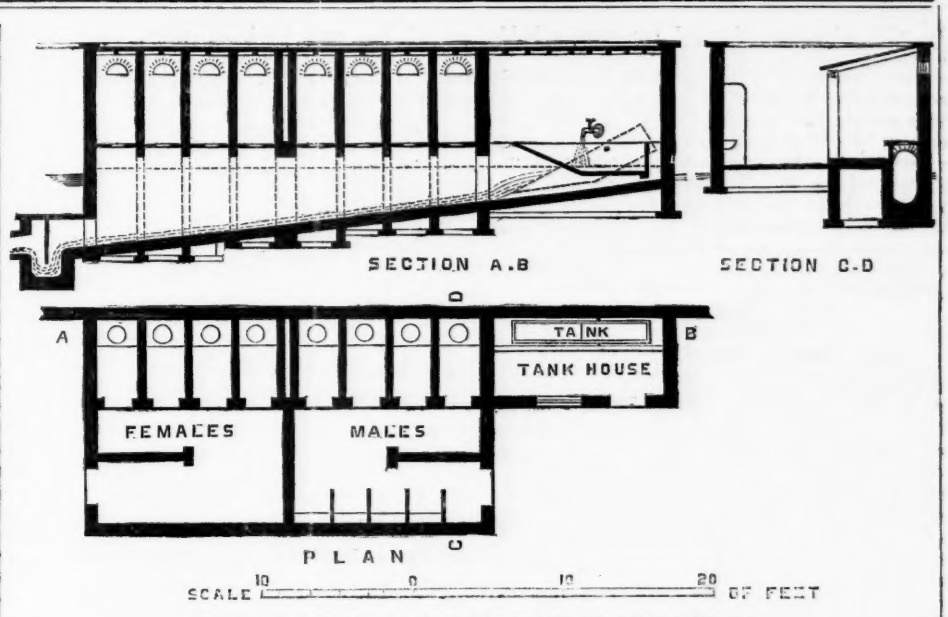
The committee for the erection of a memorial to the late Prince Consort, at Coburg, have sent an address to the Queen, thanking her Majesty for the gift of the statue.——Messrs. Edmundson & Son have completed and fixed, in the north aisle of Harpurhey Church, a stained and painted glass window in memory of the Prince. It is of three principal lights. The centre contains the subject of the Resurrection: Roman soldiers are represented at the tomb, some sleeping and others flying in terror, while our Lord appears to be rising from it, bearing in his hand a banner, inscribed, "O grave, where is thy victory?" The background is of deep blue, diapered, and the whole is surmounted with canopy work. In the dexter light are the royal arms and those of the late Prince Consort impaled; in the sinister light the arms of the Prince alone; and on the background of these lights are bands forming a cross *saltire*, and having the words inscribed, "Blessed are the dead which die in the Lord." Each light is surrounded with a crocket border. Running along the bottom of the window is the inscription—"This window was erected by three sisters, in memory of Albert the Good, late Prince Consort, A.D. 1862."—— There is some difference of opinion at Fettercairn as to whether the memorial there should be an arch at the bridge, and near where her Majesty and the Prince sojourned on their visit to the vicinity, or an obelisk. A statue had also been suggested. The subscribers have, therefore, resolved to consult her Majesty's wishes on the subject.——The sum already subscribed for the Dublin memorial is a little more than 6,000*l.* At a meeting held last Saturday, Mr. Justice Fitzgerald earnestly advocated the selection of Stephen's-green, which should be opened to the public, and be called "The Albert Park." The Lord Chancellor remarked that when the proposition was made before, some of the inhabitants opposed it, on the ground that the Green, if opened, would become a public nuisance; but Mr. Foot said, not if opened with certain safeguards—opened in the same manner as the gardens of the Tuileries. Judge Fitzgerald's suggestion was to pay off the debt due by the trustees; abolish the house-tax, as at present levied on the householders; open the Green to the public as a park and pleasure-grounds, under certain safeguards and restrictions; erect the Prince Consort Testimonial on the north side; and alter the name to "Albert Park," or some such appellation connected with the departed Prince. Alderman Roe took the same view of the subject, the further consideration of which was postponed for a general meeting of the subscribers to the fund.

RAILWAY MATTERS.

AN average day's work of the railways of the United Kingdom in 1861 was, to carry 500,000 passengers, 258,000 tons of minerals and merchandise, 35,000 live stock, 1,100 dogs, and 740 horses. The precise number of the travellers of the year cannot be stated, because there is no record of the journeys of season ticket-holders; but it must have been more than six times the number of the population of the United Kingdom. The *Times* gives some curious statistics. Thus: The trains, passenger and goods trains added together, travelled 2,897,748 miles more in 1861 than in 1860, which is equivalent to going round the world 116 times more last year than in the year before. 3,881,990 trains ran in the course of the year; that is to say, upwards of 10,600 a day, or more in a day than seven times the number of minutes in the day. If the trains had been equally distributed, running night and day without ceasing, they would have travelled among them 200 miles in every minute. The length of the line open increased by 436 miles, and became 10,869 miles; and the gross receipts of the year, 28,565,355*l.*, considerably exceeded the interest of the national debt, and amounted to about 8 per cent. on the capital. The total raised by shares and loans increased from 348,130,127*l.*, at the end of 1860, to 362,327,338*l.*; an increase of more than 14,000,000*l.* in the year. The working expenditure rose to above 48 per cent.; and the net receipts only increased by about 130,000*l.*, or less than 1 per cent. on the increase of capital. The net receipts were rather over 4 per. cent. on the capital.

It appears from a Parliamentary return, recently issued, that in the year ending December last, the Eastern Counties Railway, including by that term all the lines now combined under the title of "Great Eastern," had 1,290,278 first-class passengers; 2,441,575 second-class; 6,133,679 third-class, including Parliamentary. The number of holders of season tickets was 1,647. The number of passenger trains was 118,680, and of goods trains 52,312. The total receipts from all sources of traffic were 1,394,114*l.* The third-class passengers, as usual, produced the most money. The receipts from them were 257,726*l.*, from second-class, 209,069*l.*, from first-class 169,294*l.*, and from season tickets 18,235*l.* ——The keying in of the last arch of the Marple viaduct, on the Hyde and Marple Extension Branch of the Manchester, Sheffield, and Lincolnshire Railway, has been effected. This line, in conjunction with the Midland Railway from Rowsley (now in progress of being made, and which will join this line at New Mills), will open out the shortest route from Manchester to London, as also giving another and entirely independent line. It will also pass through some of the most beautiful scenery in Derbyshire. It is expected that the Midland portion of this railway will be completed in about two years.

SELF-ACTING CLOSETS FOR PUBLIC CONVENIENCE.



SELF-ACTING CLOSETS FOR PUBLIC USE.

WHILE upon a visit in the country, a short time ago, I was much pleased with a simple though effective contrivance for a self-acting w.c. which the vicar of the town had introduced in the offices attached to the national schools under his supervision, and which I think might be advantageously applied in the courts and alleys of our large towns, as being more conducive to the health of the surrounding neighbourhood than the arrangements now in use. The accompanying illustrations will fully explain the apparatus, which merely consists of a tank made to hold about a ton of water and of the shape shown in the sketch, so that, when swung on pivots and properly balanced, it remains perfectly level and horizontal whilst empty, but upon being filled up to a certain mark, it becomes overbalanced, thereby emptying itself of its contents, and so flushing the whole of the conveniences, when it immediately returns to its horizontal position until again filled. The supply tap is turned so as to regulate its number of evolutions per diem, from one every five minutes to one in twenty-four hours, or more, as required; and so long as there is a sufficient supply of water, it works with the regularity of a clock. The tank should, of course, be kept under lock and key, so that nobody could get at it to interfere with its working except the proper authorities. The drain at the other end of the offices ought also to be properly trapped, to prevent any effluvia arising after the soil has been swept away by a flush of water from the tank. E. WINTER.

THE SPREAD OF LANCASHIRE DISTRESS.

THE extent of the distress is assuming terrible proportions, and worse is yet to come. Mr. Farnell reports, on the 29th of September, that for *this week* the increase in the number of persons receiving parochial relief, as compared with the number relieved *the previous week*, was 6,617 persons. There were then 156,229 persons receiving parochial relief in the unions adverted to: in the corresponding week of last year the numbers relieved were 42,945 persons; so that we have in the cotton districts an increase of 113,284 in the receipt of parochial relief.

In *three weeks*, 16,064 persons in those districts have been added to the list of paupers; and, says Mr. Farnell, "I am obliged to inform you that both applicants for parochial relief and for aid from local committees of charity are still rapidly increasing throughout the district." In the unions of Ashton-under-Lyne, Glossop, Haslingden, Stockport, and Wigan, there are 32,718 operatives working short time, and 33,651 wholly unemployed. The weekly loss of wages in these five unions amounts to 27,430*l.*

These startling figures, and the certainty which there is of a large increase, and the uncertain extent of the time to which the famine may be prolonged, show the necessity for every exertion being made to meet the trouble which has fallen on this branch of industry.

On the authority of Mr. Farnell, it is stated that the average amount of out-door relief, in the twenty-four unions above referred to, is 1s. 3d.; the lowest 11¼d., and the highest 1s. 6½d.: on the average, therefore, a family of six persons would receive 7s. 6d. weekly for its support; and 2s. of this should be fairly deducted for rent; thus leaving only 5s. 6d. a week for food, firing, and clothing for six persons. We thus see how great the necessity is for assisting the parish relief by other aid. The weather will soon be such that clothes and coals will be of almost as much importance as food. We are glad, therefore, to see that useful donations of coal have been made by some of the colliery owners; and that attempts are being made for the reception of cast-off clothing and other useful articles. It is very important for the success of this movement that depôts for the reception of parcels should be established, not only in London but in other large towns; and that these reception-places should be well known, and economical means used for the conveyance of those presents to where they are needed.

When thinking of the condition of the poor cotton workers, it should be borne in mind that clothes of a fashionable style may be altered into a more homely cut; that under proper guidance coats may be transformed into jackets for boys: there will be gowns and other clothing needed for children and for women; and the alteration of dresses which may be a little too stylish for the factory girls will afford employment in the sewing schools. Many articles which will be sent might

be with advantage changed for more suitable dresses, particularly for the use of the men.

Large amounts of money have been already collected, but far more is needed to be done; and it is certain that the fund might be largely increased by a little more energetic and systematic management. Already several bodies of the industrial classes have contributed; but far more might be done. If 1,000,000 of the working men in England who are now in the receipt of good wages were to give only 1d. per week, in the three months before Christmas this would add upwards of 50,000*l.* to the fund.

THE ALPS IN THE GLACIAL ERA.

Professor Tyndall's reflections on the conformation of the Alps have been embodied, since his visit, in a communication by him to the *Philosophical Magazine*; and, as the paper is one of very general interest, especially in its bearings on the still obscure subject of the era of ice and drift, of which, and of its human denizens and their archæological remains, every one has been hearing so much of late; we shall condense the professor's views into a brief paragraph or two.

It is perfectly certain, he conceives, that *all* this mountain region was held by ice, enormous as to mass, and in incessant motion. That such an agent was competent to plough out the Alpine valleys cannot, he thinks, be doubted. That the glaciers have been the real excavators seems to him far more probable than the supposition that these glaciers merely filled valleys previously formed by water. The glacier, he considers, is essentially self-destructive. The more deeply it ploughs the surface of the earth the more must it retreat. Let the present Alpine valleys be filled to the level of the adjacent ridges, and vast glaciers, he remarks, would again start into existence; but every one of these valleys is a kind of furnace which sends draughts of hot air up to the heights, and thus effectually prevents the formation of ice.

Thus; given the uplifted land, and we have a glacial epoch. Let the ice work down the earth: every foot it sinks necessitates its own diminution: the glaciers shrink as the valleys deepen; and, finally, we have a state of things in which the ice has dwindled to limits which barely serve as a key to the stupendous operations of a bygone geologic age. To account for a glacial epoch, then, he adds, we need not resort to the hard hypothesis of a change in the amount of solar emission, or of a change in the temperature of space traversed by our system. Elevations of the land, which would naturally accompany the gradual cooling of the earth, are quite competent to account for such an epoch; and the ice itself, in the absence of any other agency, would be competent to destroy the conditions which gave it birth.

Such is Professor Tyndall's idea of the Alpine region during the glacial era.

The ingenuity of this idea is obvious; and to a certain extent we cannot see how it can be gainsaid. That the Alpine valleys were scooped out by ice rather than by flood; as, indeed, they still are; seems evident: the glaciers are the great ploughs and harrows of nature, whereby, chiefly, its barren rocks were cut up and powdered into fruitful soil; for that glaciers *flow*, as it were, like rivers themselves, though far more slowly, from height to hollow, has been clearly proved; and it is mainly by means of this perpetual movement that their channels appear to have been excavated. This idea, however, is not very new: it is almost coeval with the discovery of the glacial era itself. That glaciers, as they deepen these channels and descend to the low and warmer grounds, destroy themselves by thus coming within the influence of warmth which melts them away, is no less certain. But if this be all that is required as given data to explain the glacial era, how does it happen that glaciers could exist, *as they once did, and as they now do not*, so far *below* the lowest level of their present limits; as moraines, boulders, and other evidence far beyond and below their present reach incontestably show? *Ex hypothesi*, the present lowest limit of a glacier was its past lowest limit; is in fact the lowest limit it could have ever gone: but it *has* gone lower—much lower—in past time; and this very fact alone seems to us to be fatal to Professor Tyndall's ingenious theory.

Moreover, the glacial era was not merely an era of glaciers and moraines, but of icebergs and drift as well; and low lands, in far southern latitudes, as well as high lands are strewed with the evidences of universal ice; and not of ice alone, but of *ice and flood*; the manifest traces of which, moreover, *indicate the north pole as a common centre*. The state of things in the great era of ice and flood, in short, must have closely resembled that which *still exists* in the arctic regions; as if *it* were but the remnant of that same wide-spread icy mantle, traces of whose flowing skirts are still so visible, everywhere almost, over all the northern hemisphere, whence it has now been gathered up or concentrated much more towards the pole. The arctic region is still just such a region of ice and flood as that of which geological evidence proves the wide-spread past existence far farther south, on low land as on high. In the arctic winter, snow and ice prevail, and glaciers and icebergs are comparatively fixed; but every summer there is a grand breaking up of the whole, or nearly the whole, icy envelope; and, doubtless, the scooping out of valleys, which may also be going on in winter, must go on in the arctic summer of ice and flood with tenfold power. Such seems to have been the glacial era of past time farther south: it was not a mere sterile and eternal winter of slow-moving glaciers, but an alternation of winter and summer, and of ice and flood, just such as still exists in the arctic regions; and, however positive astronomers may be as to the impossibility of certain cognate secular changes, regarding which their data are admittedly very limited and uncertain, the conclusion is irresistible—*and they must be instructed by geological facts*—that *the arctic region itself* in truth *extended*, during the glacial era, or rather the era of ice and flood, *far farther south* than it now does in the northern hemisphere; and probably also far farther north than it now does in the southern.

Now the alternations of summer and winter, and of ice and flood, in the arctic regions, are astronomically ruled by the obliquity of the ecliptic, or the oscillation or pendulation (figuratively or popularly speaking) of the sun into and out of either hemisphere; so producing summer and winter. And astronomers not only admit the fact that the obliquity of the ecliptic *was* at one time greater than it now is, but that *it is still on the decrease*; so that the plane of the ecliptic is, and from time immemorial has been, *on the way at least towards* a coincidence with the plane of the equator. The extent and limits of this diminution constitute the only question with astronomers. They insist that the limits can only be very small; while it would appear, from the geological facts, that these limits must be very considerable; and it would be easy to show (as indeed the writer of this has, to a certain extent, already done in the *Scotsman* newspaper of 5th of January, 1842), that the "great uncertainty" in which candid astronomers admit this question to be involved is still farther increased, and to an extent which drives them entirely out of the field, by virtue of weapons supplied by themselves.

In the meantime we must conclude our cursory comment on Professor Tyndall's theory by merely remarking that it will, we hope, be seen, from what has been said, that we need not resort to the hard hypothesis of a change in the amount of solar emission, or in the temperature of space traversed by our system, for an explanation of the era of ice and drift; because we have shown how it is explicable, to the fullest extent, by simple and natural *causes*, in one sense still *in actual operation*.

MUSIC AND THE STAGE.

At the *Royal Opera House, Covent Garden*, "Satanella," "Dinorah," and "Fra Diavolo" have varied the performances; the latter noticeable amongst other things for the clever acting of Mr. Weiss as the "English Lord." Miss Pyne was to reappear on Thursday evening, after an indisposition, in "Crown Diamonds." Miss Sara Dobson, who has this season assumed several of Miss Pyne's parts, has pleased her audience, notwithstanding the dangerous comparison which is unavoidably forced on hearers. "The Puritan's Daughter" is to be produced this (Saturday) evening, with a cast embracing Mr. W. Harrison, Mr. Santley, Mr. Weiss, and Miss Pyne. Country visitors fill the pit and gallery to overflowing, but leave comfortable room in the boxes for all who wish to enjoy pleasant music.——At the *Haymarket* this is not the case without making previous arrangement; *Lord Dundreary* still continuing his remarkable career. A new farce by Mr. Sterling Coyne, called "Duck Hunting," gives Mr. Compton an opportunity to exert his farcical powers. It is a funny *imbroglio*, but has not much in it.——At the *Adelphi*, the well-known "Green Bushes" has enabled Miss Avoina Jones, in the part of *Miami*, to gain an improved opinion from the public. Miss Woolgar and Mr. Toole are excellent in it, and the revival appears to please. The piece is one of the best of its class, but has been seen by all London playgoers. We would direct Mr. Webster's attention to the "Heart of Mid-Lothian," now being played at the *Standard* theatre, and which would suit the *Adelphi*.——Some of the parts are very well acted at the *Standard*, notably by Mr. Gourlay, a Scotch comedian, and Miss Mary Booth, the latter of whom, as *Madge Wildfire*, plays with a naturalness and *abandon* not often seen in so young a performer. The scenery is effective, and very well painted.——From abroad comes the report of a novelty; to the effect that a Belgian scientific dramatist, Mr. Rohde, has lately produced at Brussels a geological drama in forty-five *tableaux*, in which the pre-Adamite conditions of the world (from the Nebula to the Third Red Sandstone) are presented to the audience! Moreover it is said to be successful.——Several striking changes are about to be made in English managements. Mr. Boucicault has taken *Astley's*; and moreover appeals to the public to build a new theatre with proper accommodation,—absent in existing houses. Mr. Falconer takes Drury Lane out of his hands. Mr. Fechter will shortly open the *Lyceum*, with the "Lady of Lyons," Mrs. Charles Mathews playing *Pauline*, and himself the gardener's son: while an Attorney has taken the *Princess's*, to enable his daughter to play legitimate drama.

WHY NOT A NEW STYLE?

By a deduction from similar principles to those of "Zeta," we may conclude that the contemplated improvements in modern ordnance are not the "healthiest symptoms;" and that a pure and rational desire for progress in any science betrays no small amount of quackery; although more fitly would the unmeaning opposition to this progress be qualified by such aspersions.

The yew-bows and old "hearts of oak" have given way to necessity; and so certainly must the architecture of this period, sooner or later, give way. No doubt there were tars in these old specimens of naval architecture who considered that they possessed every requirement, and declaimed lustily against every innovation; and for the same reason we can excuse those who hold to the present practice in a line which, although not in so great a measure controlled by necessity, yet admits of much nobler exercise.

By the same correspondent a doubt is admitted as to the possibility of improving our Gothic: the same is advanced by others as regards the Classic: are these the healthy symptoms? I fear not; and the architecture of much-cherished precedent is on the totter.

Another correspondent persuades us that we already have a new style (and, in fact, it does not seem to be well known what we have); and, in a heterogeneous mixture of ideas, tells us that "the requirements of the day have been great and many," but "been met by an infinite originality of genius:" these masterpieces are again pronounced abortions, and the whole wound up by an unsuitable simile.

What is this shadowy and indefinite writing but mere trifling? or is it written for sheer writing's sake? What is not dead, but sleepeth? Let us embark on the Thames (or the river of any large town), and pass merely from London Bridge to Westminster;—see if Gothic sleepeth; our Christian style in all its degrees of hardness: or is it Classic? here it is, and made to perform every vagary.

Why do we practise both, but because neither is satisfactory. Is Gothic so very consistent with itself, and the line of demarcation so well adhered to in every instance, but that even Goths would find it difficult to determine to what phase it belonged?

Is it that of the ancients? Then we have no progress. If we answer, No! then if there is a possibility of departing thus far: there must certainly be of going further. But this possibility is not acknowledged, and the many cheat themselves into the idea that they are not acting on it.

What is design in modern architecture? A correspondent has characterized it as the apposite placing together of ideas of former knownsubjects floating through the brain. Would that it were so: we should then have more originality; but it is rather thus: Hand me such a book: turn it over: place a mark here: we will have this doorway: here is a very nice oriel: let us have such a cornice as this: I like this balustrade;—and the ready drudge, the assistant, sticks them together.

And so it is, with a shaft from Durham, a window from Land's End, an arcade from Ely—in a meaningless position,—and a roof from the Louvre: the thing—can I dignify it with a better name?—is put together. Or if it be Classic;—

pediment above pediment, stuck up cornices over the windows, column above column. And what would brand the plagiarist is allowed to pass in the architect; there is such an impossibility for inventive design in modern heads; I would rather say such an unwillingness to try. It has been tried, say they, and failed! Down with it! no stimulation to try again. And so, deny to architecture a rule which they admit holds good to those who strive to overcome in every other science. But perhaps they are right in withholding the rule from architecture, as there is no striving to overcome in it (except as regards the plan, which is under the rule of stern necessity); and it costs little thought to throw a heap of ready materials together.

Some of the advocates for Gothic assert, that it has not reached its perfection; and the devotees of Classic claim the like. I ask, Do we hope to improve what the originators perfected; or, shall we say, could not perfect?—we, who cannot produce a style of our own! I say, Are *modern architects* the proper parties to perfect the styles of other times? Styles produced by men in a rational way; men who had not the advantage of each other's thoughts in the measure we have: how did they produce them? what were the germs that led to their several peculiarities? The necessities or fancied necessities of construction: the horizontal construction led to the horizontal style; the vertical construction to the vertical: is either, in its integrity, entirely applicable to modern requirements? Mark the piers of the Gothic as points of support between the windows, so arranged as to take the thrust of the roof; the roof itself of stone, a complete sham! The panel-space between the groining ribs—of stone? yes, of stone; but how thick? I could point to one of our finest 3 inches thick. Is this the idea we are supposed to be impressed with from a stone roof? Are we accustomed to look on enduring stone as a thin film, protected by a roof of wood and lead?

Classic was not marked by innate mal-construction; but, being the production of a refined, not a barbarous people, is highly consistent with itself; but is neither consistent with our manners nor climate. Still, from it we may gather more ennobling principles. Here is the column, the point of support; as a decoration, entirely constructive. What is the source of its beauty? Not the meretricious ornament of Gothic; but the beautiful ratio of the parts; a point of support, necessitated by gravitation, rounded on plan because softest to the eye, and best adapted to stand the weather; with its mouldings at base and capital, as the most æsthetic, varied, and appropriate finish to the perpendicular lines. And if it be allowed that the structure of wood furnished the germ or suggestion for the birth of such an architecture, shall the suggestion of as potent a germ or germs be wanting among us, should we unite our efforts?

True that former styles have been the birth of "uncontrollable circumstances." Did the originators of these styles know as much of universal styles as we do? They did not, and were forced to express their ideas in a creation of their own; or is this a proof (when we are moved by the necessity of progress and the beauty of variety) that we cannot, if united and gaining the benefit of each other's assistance, set up a style to express our ideas?

None can reasonably deny the possibility of founding our own architecture (at present we have no architecture of our own). Seeing that there are so many different styles, the probability, nay, the certainty is, that there might be more; and, once acknowledged, it is the duty of every professor to endeavour truthfully to advance the art which he professes.

VERITAS.

A NEW STYLE AND A FEW FALLACIES.

IF the number of articles and letters that have appeared on a new style have not already converted the question into an old and established one, I shall be glad if you can afford me space to point out a few of the discrepancies that have crept into the discussion on this question. Of course, any suggestion or design that necessitates a divergence from the accustomed track either of thought or action, combats the conservatism which exists in a less or greater degree in all English minds; and the unhappy discoverer who invents a new power or proposes an improvement calls down upon his unprotected head the violent wrath of correspondents like "Zeta," who, instead of discussing the subject and its principles in the *abstract*, deal in vague generalities, and try to extinguish it by stigmatizing arguments, which they do not refute, as "palaver," earnest efforts as "quackery," and sneeringly questioning the possibility of anything being brought forth in the nineteenth century of a "*bran-new*" description.

"A. P. G." invokes the assistance of scriptural phrases to enforce his objections; for arguments they are not; and informs us that "we never can make even *one* life out of a valley full of dry bones;" but, unfortunately for his paraphrase, Ezekiel tells us, that when the breath came from the four winds, the bones lived, "and stood up upon their feet an exceeding great army." It appears to me that the simile would be more applicable as an illustration in favour of a new style than against it. He concludes his letter by asserting that the present style "is not dead, but *sleepeth*;" overlooking the fact, that this state of hybernation is the cause which has forced the present movement into being, and is now labouring to awaken the profession to a sense of its lethargy.

Another writer startles us, in an elephantine manner, by assuring us that Solomon has said that there is nothing *new* under the sun. Granted, when speaking of nature collectively; but to assert that it has connexion with any new combinations that may be effected in science or the fine arts, is simply absurd. Inventions and discoveries might be cited to an immense extent in proof of this.

It appears to me, that if the question of a new style is to be adequately discussed, its opponents must drop generalities, and discuss the movement on its own merits, by admitting or refuting the arguments which have been advanced in its favour.

M. A.

A COMPLAINT FROM ST. JAMES'S, WESTMINSTER.

SIR,—Various works have been done within the last few years, and are now being done, in the parish. The principal of them that may be mentioned are, the Baths and Washhouses; a large portion of the workhouse, with the chapel; St. Peter's new church, Great Windmill-street; also a new vestry hall, with new wall and entrance to the churchyard. At the present time new windows are being fixed in the parish church, and the exterior works are being painted, &c.

Will it be believed that the whole of these works have been done by builders residing out of, and at some distance from, the parish? We have, at least, eighteen or twenty builders and a number of decorators within the parish, many of them paying pew-rents in the churches and chapels, and all paying the rates and taxes. With very few exceptions, they have never had an opportunity of competing for any of the works. Why should our money be taken out of the parish?

I would ask our worthy churchwardens, and those who have the management of the affairs of the church and parish, whether such disrespect to their brother parishioners is warrantable in such a wealthy parish as St. James's?

A PARISHIONER.

THE LIGHTING OF GREEK TEMPLES.

SIR,—As the question how light was admitted to, and rain excluded from, the cella of a Doric temple seems still to be unsettled, allow me to suggest that in peripteral temples the apertures in the roof were over the centre of the pronaos, and the cross wall in front of the cella was carried no higher than the ceiling of the peristyle. The light entered the cella through the space between the top of the cross wall and the roof, and fell in one mass on the image opposite, while the source whence it came was unseen by the spectators. It was entirely or partially excluded, at pleasure, by a curtain (*peplum*), for which a movable shutter of boards was substituted in winter as a protection from the weather. (*Stratura ex tabulis quæ æstate tollerentur et hieme ponerentur.*) Rain passing through the apertures (*per culminis aperta fastigia*) fell on the ceiling of the pronaos, and readily found its way to the pavement through one constructed like that of the Temple at Rhamnus, described in "The Unedited Antiquities of Attica." As the roof of the peristyle formed a counterpoise to the roof of the cella, no truss was needed, but merely rafters, crossed by laths and boarding, on which the tiles were laid; an open-timber roof, the underside of which was the ceiling of the cella, differing in appearance from the stone ceiling of the peristyle only in being inclined instead of level.

In temples like the Parthenon (hypæthral), with an open court surrounded by columns leading to an inner hall covered by a roof, the hall may have been lighted in a similar manner; viz., by openings in the pediment of the cross wall between the hall and the court. Chryselephantine statues must have stood in the hall.

If the roof of a peripteral temple had a number of small apertures on each side of the ridge, formed merely by the omission, in alternate rows, of a few flat tiles only, all the *lines* of the roof were unbroken. With an open court, of course, the ridge could not be continuous. In the Parthenon this would scarcely be seen from any part of the Acropolis: from a distance I doubt if a landscape painter would call the break a blemish.

If any evidence on this subject is to be found in Egypt, that of the Ptolemaic temples should not be rejected; particularly the points wherein they differ from the earlier structures. The practice of the Greeks may be best learned from changes which there is good reason to ascribe to their influence. In the Pharaonic temples light is admitted through clerestories parallel with the sides of the building; but in those built under the Greeks and Romans it enters the halls through the cross walls. The two systems are readily understood by comparing the sections of the south Temple of Karnac and of the Temple at Kalabsche, given in Mr. Fergusson's "Handbook of Architecture."

Philadelphia. W. RUSSELL WEST.

ON THE PROPORTIONS OF CHANCELS.

MANY of the copyists of Mediæval architecture content themselves with imitating detail without regard to general proportions. And thus it is that modern churches do not present so good an outline as those built by our ancestors.

Of the proportions of the arches and columns in the nave, I forwarded some remarks a few years ago; and, in all examples I have since measured, I have found the proportions agreeing with what I then stated.

Concerning the chancel, I find that its proportion, in nearly every Mediæval example, may be reduced to this formula:—East to west, $5a$; North to south, $2a+5$. So that for every additional 2 feet in width we have 5 feet more in length. Thus, chancels 15 feet wide are 25 feet long; those 17 feet wide, 30 feet long; 19 feet wide, 35 feet long; 21 feet wide, 40 feet long, &c. When this rule is departed from, there is generally a subsequent alteration to account for it. This rule makes the smallest chancels the broadest in proportion; so that smallness of size does not produce insignificance, nor largeness monstrosity. The width of the chancel appears to have been the key dimension to the whole fabric.

We have 35 feet clear for a cathedral, as at Winchester, Ely, Old St. Paul's, Lichfield, and most others. Forty-five, or thereabouts, for a metropolitan cathedral, as York, Paris, and others. Canterbury (35 only) is built on the site of a Saxon church. For an arch-deaconry church, 24 feet, as at Ipswich, Chelmsford, Hertford; for town churches 21, 19, and 17 feet; and in villages, 17 or 15 feet.

W. SCARGILL.

BELL-RINGING.

SIR,—Now that the subject of bell-ringing is being discussed in your columns, may I be allowed to ask if any of your correspondents learned in such matters can recommend me a really good work on "Scientific Change-Ringing"? I have been for some time anxious to obtain one; but no ringers that I am acquainted with know of any such book.

It may interest some of your readers to hear that in the town of Gainsborough an "Amateur Ringing Club" has been in existence for about a year. It receives the sanction of the vicar of the parish; and includes among its members two clergymen, two schoolmasters, one churchwarden, and an organist; besides other prominent and influential individuals of the town. The members meet for practice, I am told, every Friday evening; and have already made satisfactory progress under the direction of one of the regular church ringers.

Could not similar societies be easily formed in most of our towns, and even villages?

FRED. JEPHSON.

Books Received.

IRON.

Results of an Experimental Inquiry into the Comparative Tensile Strength and other Properties of various Kinds of Wrought-Iron and Steel. By DAVID KIRKALDY. Illustrated by numerous plates. Glasgow: Printed by Bell & Bain. 1862.

THE importance of this laborious volume is unquestionable; but we think the author ascribes too little to his predecessors in such inquiries, especially as regards wrought-iron, when he says:—

It seems remarkable that, whilst we have the results of

many important and reliable experiments on cast-iron, extremely few have been made, or at least published, on wrought-iron, and almost none on steel."

And all the more, since he makes such admissions as the following:—

"The breaking strain per square inch of wrought-iron is generally stated to be about twenty-five tons for bars and twenty tons for plates. This corresponds very nearly with the results of the writer's experiments, of which the following table presents a condensed summary:—

	Highest. Lbs.	Lowest. Lbs.	Mean. Lbs.	Tons.
188 Bars, rolled	68,848	44,584	57,555	= 25⅔
72 Angle-iron, &c....	63,715	37,909	54,729	= 24½
167 Plates, lengthways	62,544	37,474	50,737	= 21¾
160 Plates, crossways	60,756	32,450	46,171	

The author's experiments with steel are probably of much greater importance than the others; particularly if those experienced men be right who do not hesitate to predict that a time is coming when there will be no such thing as either wrought iron or cast; and when steel will be the only practical and available form of the metal, in use for every purpose.

Amongst Mr. Kirkaldy's results, as regards steel chiefly, we select the following:—

"The breaking strain and contraction of area of *puddled*-steel plates, as in iron plates, are greater in the direction in which they are rolled; whereas in *cast*-steel they are less.

Iron, when fractured suddenly, presents invariably a crystalline appearance: when fractured slowly, its appearance is invariably fibrous.

The appearance may be changed from fibrous to crystalline by merely altering the shape of specimen so as to render it more liable to snap.

Iron is less liable to snap the more it is worked and rolled.

The mixed character of the scrap-iron used in large forgings is proved by the singularly varied appearance of the fractures of specimens cut out of crank-shafts.

In the fibrous fractures the threads are drawn out, and are viewed externally; whilst in the crystalline fractures the threads are snapped across in clusters, and are viewed internally or sectionally. In the latter cases the fracture of the specimen is always at right angles to the length: in the former it is more or less irregular.

Steel invariably presents, when fractured slowly, a silky fibrous appearance: when fractured suddenly, the appearance is invariably granular; in which case also the fracture is always at right angles to the length: when the fracture is fibrous, the angle diverges always more or less from 90°.

Steel is reduced in strength by being hardened in water, while the strength is vastly increased by being hardened in oil.

The higher steel is heated (without of course running the risk of being burned) the greater is the increase of strength, by being plunged into oil.

In a highly converted or hard steel the increase in strength and in hardness is greater than in a less converted or soft steel.

Heated steel, by being plunged into oil instead of water, is not only considerably *hardened*, but *toughened* by the treatment.

Steel plates hardened in oil and joined together with rivets are fully equal in strength to an unjointed soft plate; or the loss of strength by riveting is more than counterbalanced by the increase in strength by hardening in oil.

Steel rivets fully larger in diameter than those used in riveting iron plates of the same thickness being found to be greatly too small for riveting steel plates, the probability is suggested that the proper proportion for iron rivets is not, as generally assumed, a diameter equal to the thickness of the two plates to be joined.

The shearing strain of steel rivets is found to be about a fourth less than the tensile strain.

The most highly converted steel does not, as some may suppose, possess the greatest density.

In cast-steel the density is much greater than in puddled-steel, which is even less than in some of the superior descriptions of wrought-iron."

The author solicits special attention to the practical use that may be made of a new mode of comparison introduced by him in reference to such experiments as those of which he treats; viz.,—"the breaking strain per square inch of the fractured area of the specimen, instead of the breaking strain per square inch of the original area."

Formulæ, Rules, and Examples, for Candidates for the Military, Naval, and Civil Service Examinations; for Mathematical Students and Engineers. By T. Baker, C.E. Division I. Also *Iron-work: Practical Formulæ and Rules for finding Strain, &c., of Wrought-iron Bridges; with Tables.* By C. H. Dowling, C.E. Division II.; complete. London: Weale, 1862.

In this small volume are collected into a brief space numerous useful formulæ, rules, and examples, in every branch of the mathematics; accompanied by explanations of their nature and use; the whole arranged in alphabetical order, and admitting of ready reference. By way of appendix also a large collection of examples and problems have been added by Mr. Dowling; taken from recent military, naval, and civil examination papers; with several original problems and examples on all the preceding subjects. A desideratum has thus been supplied from which students may reap much advantage.

VARIORUM.

Routledge's "Popular Guide to London" (of course, a shilling), written by Mr. G. F. Pardon, has the advantage over some similar works in being a very readable as well as instructive little book. We have already quoted a paragraph from it; but will take, as a second, one referring to what may be called Manufacturing London:—

"The purely manufacturing parts of London lie between the City and the suburbs—a sort of debatable land that is neither city nor suburb. Clerkenwell is the chief seat of the watchmaking and jewelry trades: Spitalfields and Bethnal-green are the long-established homes of the silk and velvet weavers: most of the cabinet-makers and carvers are located about St. Luke's, Old Street-road, and Aldersgate-street: the ironfounders and anchor-smiths, together with the shipwrights, riggers, and boiler-makers, are to be found in Blackwall, Poplar, Millwall, and the Isle of Dogs: the sugar-bakers and refiners carry on their business in the neighbourhoods of Whitechapel and Commercial-road: the tanners, parchment-makers, and skin-dressers reside in Bermondsey: the potters and glass-makers live in Lambeth; the tailors principally about Golden-square and Burlington-gardens; the working boot and shoe makers in and about Shoreditch, and also in the courts and narrow streets near Drury-lane; the producers of plaster casts and images, in Leather-lane, Holborn, and the surrounding courts; the hatters principally in Southwark; the paper-makers chiefly in Surrey, on the banks of the Wandle; the chemical manufacturers at Stratford, on the banks of the Lea; the carriage builders in and about Long-acre; the boat-builders at Lambeth and Chelsea; the toy-makers and doll-dressers at Hoxton; and the brewers everywhere."

In the *Gentleman's Magazine* Mr. Parker very properly reproaches the Archæological Institute for their silence in respect of the shameful destruction of the "Guesten Hall," at Worcester. He says,—"It does appear to me that the least which the Archæological Institute could do was to express regret at the loss which the country has sustained, without expressing any censure upon any one; and that obedience to the constituted authorities has its limits. If the committee studiously neglect and ignore the primary object for which the society was established, individual members are absolved from their allegiance. I, for one, joined the Institute originally, and continue to belong to it, under the idea that its main object was, and is, the preservation of the historical monuments of the country, by calling public attention to them, and stirring up those whose duty it is to preserve them. This I believe to be the avowed object of the society; and, although its efforts may be unavailing; for I see such monuments disappear before my eyes every year; still I do not believe that this is a mere hollow pretext, and that the real object is tuft-hunting, getting into good society, an excuse for an annual holiday and a feast, which are the allegations made by the enemies of our society. If I believed them to be true, I should cease to belong to it. But, on the other hand, I will not willingly give an appearance of plausibility to such charges by *too great* pliancy and subservience to authority, when it is the plain duty of such a society to speak out and protest against the *needless* (which I still contend it to have been) destruction of an historical monument."—The Catalogue of the International Exhibition will be continued in the *Art Journal* (12 pages) into the 1863 volume for probably six months. It was found impossible to represent the collection in less space. The want of some principle as to *scale* is much felt in respect of these otherwise excellent illustrations: a card-case, for example, being given full size, looks as large as an important tazza represented by the side of it; and so on. It would be difficult to avoid this; but a few dimensions now and then in the letter-press would lessen the inconvenience. When complete, it will be a most valuable record and suggester.—"The Life and Times of Samuel Crompton, Inventor of the Spinning Machine called the Mule. By G. F. French, F.S.A. Third Edition. Manchester: Simms & Co. 1862." The inauguration of a monument to Crompton was an auspicious time for the issue of a new and cheap edition of this interesting narrative. In the preface to the present edition Mr. French says:—

"The life of Samuel Crompton was selected by the author for his address to working men as a subject well worthy their most serious reflection. Holding up much for their encouragement, there is also in it much of warning, as it demonstrates that natural ability of the highest order, even when supported by education, industry, sobriety, and frugality, does not exonerate any man from the duty of acquiring a knowledge of his fellowmen, and of learning how to deal with them in the business of life. His practical disregard of this knowledge was the stumbling-block that impeded every action of Samuel Crompton's life. Had he studied human nature with one tithe of the persevering skill and energy which he devoted to his mechanical pursuits, his name would have ranked now among the highest in the nation, and his posterity among the wealthiest of its commercial aristocracy."

Miscellanea.

The Henry II. Ware.—If a strange paragraph as to a remarkable collection of works of art in Brittany, just made public by the death of the owner, be correct, a great addition has been made to the number of specimens known to remain of the curious *Henri Deux* ware, as many as thirty pieces of it being found.

The Builders' Benevolent Institution Dinner.—The annual dinner in aid of this institution will be held on the 29th of this month; Mr. Henry Lee, the president, in the chair. We have so often and for so many years urged upon our readers the claims of the Builders' Benevolent Institution, that we have no fresh words for the purpose; nor indeed can they be necessary. Gentlemen who are willing to act as stewards should send their names at once to the secretary.

Arbitration.—Serjeant Kinglake has been sitting, for four days, at the Queen's Hotel, Torquay, as arbitrator in the matter of Harney *v.* Horsfall. The plaintiff is a builder, of Torquay, and sues defendant, a merchant, of Liverpool, for balance of contract amount for erecting a villa, and also a large amount of "extras" incidental to the contract. On the other side, the liability for most of the extras is denied, and a very large set-off in the shape of penalties pleaded. The learned serjeant has received all the evidence, and has to make his award on or before the 4th of November.

Improvements at Holyrood, Edinburgh.—A new military guard-room has been erected opposite the palace, with stabling and coach-house in the court-yard behind. The plans for the new building were approved about two years ago by the Prince Consort, and they have now been carried to completion. The central feature of the new buildings is a gateway of Scoto-Gothic charater, flanked by two massive towers projecting from the front, and surmounted by an attic story. The Abbey Court-house, at the foot of Canongate, has been renovated in keeping with the new line of buildings, and the house which formerly occupied the south corner has been refronted with battlemented cornice and projecting tower; the whole forming a symmetrical façade of 245 feet directly opposite the palace.

The Manchester School of Art.—It appears that this school is in danger of being given up from want of funds. Surely in such a place as Manchester this can never be allowed to occur. Owing to a change of masters the school has unexpectedly lost 300*l.* per annum, which was previously paid by the Department of Science and Art. This grant is now withheld. The question thence arises—What is to be done? The school cannot be maintained without the grant, unless a similar sum can be locally raised. One quarter of the stoppage has already been paid out of the school funds, and no more can be afforded. It is therefore for the merchants, the calico printers, and others connected with the trade of Manchester, to decide whether so important an institution—so necessary to the cultivation and development of good taste and true artistic feeling, shall be allowed to be annihilated for want of support.

Proposed Thoroughfare under Farringdon-street.—At a recent meeting of the City Commission of Sewers, Mr. H. R. Newton propounded a plan for relieving the traffic at the cross junction of Fleet-street, Farringdon-street, Ludgate-hill, and Bridge-street, which he submitted was worth consideration, having regard to the prospect of the traffic being rapidly increased, excessive though it now is, by the opening of the widened Blackfriars Bridge, and the establishment of two railway termini adjoining; viz., that of the London, Chatham, and Dover Company in Farringdon-street, and that of the Metropolitan Company in Victoria-street. The proposition is to sink, by a gradual incline, a width of about 20 feet, in the centre of the road in Farringdon-street and Bridge-street, the sites of the present cab-stands, commencing about Fleet-lane on the one side, and at Union-street on the other, so as to form a free passage under the old Fleet Bridge and under the ordinary roadway, for a double line of carriages for what may be termed the Blackfriars Bridge and Holborn traffic, and thereby obviating any collision between it and the cross traffic of Fleet-street and Ludgate-hill. For equalizing the general width of the approaches a slight alteration, he said, in the pavement in Bridge-street would be required, and also the setting back of the railings in the open space in front of Crescent-place, under which space runs the main sewer. Without altering the levels of the existing streets, he states that the gradients could be easily formed to pass under the cross junction of from 1 in 20 to 1 in 30.

The "Catholic University" Foundation Stone.—It was roundly asserted, some time since, says the Dublin correspondent of the *Morning Post*, that the foundation-stone laid by Archbishop Hughes had been removed; but this statement proves erroneous. It was simply buried out of sight, and the field in which it was placed turned into grass land! The university is regarded, therefore, as a shelved project; indeed, many persons insist that the laying of the stone was only a demonstration against the Government. Moreover, there was a never-ceasing hammering at it for small bits, to be treasured as relics, it being a blessed stone! and, to prevent its total destruction, it had to be buried.

Glass Bricks.—Light might be increased in darkly situate rooms and in cellars, and all underground places, by the use of *glass bricks*, either in a *solid* state or having their cores or central portion hollow; but having a thick crust or sides around such cores. The adoption of these in buildings would, it is conceived, prove a very great improvement, and increase the capability of house illumination considerably. A number of these being built in a portion of an ordinary (*clay*) brick wall would throw light into many a dark corner, or place, at a trifling cost compared to that of inserting a sash-frame or window. These could of course be pierced with holes and otherwise made subservient to a ventilative purpose. Might not, also, glass apexes or other forms of ornamentation be successfully employed *in the outer and top embellishment of houses?*—Luosa.

Works at Clay Cross.—The Clay Cross Company, finding it desirable to erect a large pumping engine, in order to lay off several small ones, determined to sink a new shaft exclusively for pumping purposes. They commenced sinking early in the present year; and on the 12th ultimo succeeded in getting to the bottom of the coal, which is 130 yards deep. The shaft is 10 feet in diameter, clear, and is cased with 9-inch brickwork the whole depth. The time occupied in doing this work has been twenty-five weeks. They have also got the engine-house built for a 300-horse power engine, and part of the engine erected during the same time; and in about two months they expect to commence pumping. The engine is being made by the Butterley Company, and will have a wrought-iron beam, composed of two slabs 37 feet long by upwards of 7 feet wide, and each slab 2 inches thick. The pumps are being cast by Mr. Barrow, at Staveley.

Further Discoveries in Pompeii.—Amongst the recent excavations described by a correspondent of the *Athenæum* are those of two handsome edifices containing various fine frescoes. In the Strada Abbondanza one of these stands: it is said to be one of the largest houses in Pompeii; but we rather think it is one which has been described before. The Judgment of Paris is the subject of one of its finest frescoes; and Achilles, in female garb, is another. The bed-rooms are mere cells, 10 feet by 7 feet, but very lofty: they contain each a recess, 3 or 4 feet in length, which the cicerone divined was for the head of the sleeper. The other edifice referred to is one of the most highly-ornamented houses of Pompeii. There are here really beautiful pictures, of course in fresco,—as, for instance, Apollo and Neptune superintending the building of the walls of Troy; Hercules drunk, and Love stealing his club; Thetis receiving from Vulcan the arms of Achilles. But the *capo lavoro* of the house is the head of Vulcan: it is said to be magnificent. The intervals between the pictures are filled up with Corinthian columns, exquisitely defined, and various other ornaments. Above and below run broad beautiful borders, painted with scrolls and animals. Birds are perched in bushes: ducks are diving for insects or fish; and above the higher border are the remains of an upper floor of the house. In another room of this very splendid building the walls are divided into compartments, in the centre of which, on a black ground, are *danzatrici*, with cymbals, or tambours, or cups, and one with a serpent twisted round her arm. Some of the figures are perfectly new. In one of the walls is a large interval, occasioned by the removal of one of the pictures in consequence of the novelty of the subject,—a warrior undergoing a surgical operation. This house is not yet entirely completed. The excavation of the house of C. Cor. Rufus has just been completed. It is remarkable for two male figures, which have much puzzled the antiquaries. Their dresses are modern,—one wearing long pantaloons, with a tunic, like a jacket, reaching down to the waist; and the other, slashed breeches down to the knee; shoes, or short boots, and the stockings or legs bound round with cords.

The New Hospital at Birkenhead.—We understand that Mr. Laird, M.P., has contracted with Mr. Hogarth, builder, for the construction of the new hospital. Preparations are already made for commencing the work. The situation fixed upon is fronting Conway-street, and overlooking the park, close by the Proprietary School. Mr. Walter Scott is the architect.

The New Mechanics' Institute, Evesham. This building, which has just been completed, was designed by Mr. J. Hunt, of Evesham, architect, and built by Mr. John Meddings, of the same town. It is of red brick, and plain in character. It has on the ground floor a principal and side entrance, and three circular-headed windows; and on the first floor five square-headed windows. On the basement is the kitchen; and on the ground floor, in front, is a reading-room for first-class members of the Institute. At the back of this is the reading-room for mechanics. On the first floor is the assembly-room, the length of which is 54 feet, the breadth 22 feet, and the height 18½ feet: behind is the library. The cost of the building was 1,100*l.*

Curious Arctic Discoveries.—Captain C. F. Hall, commanding the *George Henry*, has sent a telegraphic message to his employers at New York, in which he says:—I have determined the fate of, probably, two boats' crews of Sir John Franklin; solved the mystery of 300 years relative to Sir Martin Frobisher's expedition under the auspices of Queen Elizabeth; have learned the fate of five men captured from Frobisher by the Esquimaux; found and identified the exact place of their landing and prior account of Warwick's Sound therefrom; Frobisher's attempt to plant the colony of 100 men; recovered a large number of relics of said expedition; and have explored over 1,000 miles of coast, including the so-called Frobisher's Strait.

Sanitary Condition of Gloucester.—The fourth report on "The Sanitary Condition of Gloucester and its Vicinity" has been published. It gives the statistics for 1861. The average death-rate in the city proper in 1840-1-2 was 28·45 per 1,000: in 1861 it had been reduced to 21·26 per 1,000,—a saving of seven lives in every thousand of the population. The population of the city parishes in 1861 was 16,220; the births, 613; the deaths, 344. No less than 90 of the deaths were children under five years old; and the next highest classes of sufferers were persons aged between 50 and 60 years,—42. The highest death-rate was in the parish of St. Mary de Grace, 27·88 per 1,000; and the lowest in St. Michael, 13·11 per 1,000. The population of the suburban district of the city in 1861 was 9,149: the births were 340 against 340 in 1860; the deaths 177 against 160 in 1860. The death-rate was 19 34 per 1,000, or 51 living to every death. The highest death rate was in the South Hamlet, 26·97; and the lowest in the North Hamlet, 12·29 in Kingsholm St. Catherine it was 14·65; and in Kingsholm St. Mary, 21·25. The infant mortality was 40·07.

Taunton School of Art.—The annual meeting of the friends of this institution, for the distribution of prizes, has just been held in the school, Bath-place. Mr. F. W. Newton presided; and the meeting was attended by a large number of the students, and of ladies and gentlemen taking an interest in its welfare. In moving the adoption of the report, Mr. R. G. Badcock said the school had been established now seven years, and he was glad to find that it sustained its character, and that this year there were a greater number of prizes and medals than in any former year; there being, he understood, so many as one hundred and fourteen prizes and medals, besides one national medallion. The chairman, in his address, said:—The number of prizes proves the capacity and indefatigable perseverance of the head-master, and also the determination of the students to avail themselves of it by hard work. Now, hard work I take to be the best subject to dwell upon this evening, and I will tell you why. My idea is that excellence in anything is unattainable without hard work. Depend upon it, "there is no royal road to learning," or, indeed, to eminence in anything without working for it. I will not go the full extent of the axiom laid down by Sir William Jones, and say that "every man may do what man has done." I don't mean to deny that there is special genius for special purposes, but I do maintain that *genius* is only another name for capacity for hard work. The power of concentrating all one's faculties on one subject, of giving all one's mind and soul to it, is really the test of genius. Those heaven-born geniuses whose works we contemplate with such admiration are really the hardest workers.

Opening of the Great Organ at Doncaster Church.—The great organ, built here by Herr Schultze, of Paulenselle, Germany, has been opened in presence of the leading clergy and inhabitants of the district. It is said to have proved satisfactory. The cost of the organ is about 3,000*l.*, and five years have been occupied in its erection.

Mediæval Paintings.—The restoration of Kingscliffe Church, now in progress, has led to the discovery of several Mediæval paintings on the walls. One is illustrative of the legend of St. Margaret and the Dragon: another appears to represent the festival of All Saints. The Rev. E. Wells and the Misses Berkeley are taking steps for the preservation of these relics.

The Cathedral of Sydney.—At a recent meeting, presided over by the Governor, Sir John Young himself puts down his name for a subscription of 33*l.* 6s. 8d. a year, for three years, towards the general fabric of this cathedral; Mr. C. Kemp, Mr. T. S. Mort, and Mr. John Campbell, for 100*l.* a year for the same term; and the Bishop of Sydney, who is the only clergyman on the list, for 25*l.* a year. In addition to these subscriptions towards the general fabric, twenty-one persons have made themselves responsible for as many stained-glass windows for the nave. Already 3,000*l.* have been guaranteed. The east window is to be a memorial to Bishop Broughton: Mr. Mort gives the west; Archdeacon Cowper, Mr. C. Kemp, and seventeen other laymen one each. Mr. William Mort, of Fenchurch-street, in London, takes the financial management of the work in this country, and the Rev. E. Coleridge, of Eton, the artistic.

Explosions of Copper Gaspipes.—Some time since, it was discovered that, when gaspipes constructed of copper or bronze have been long submitted to the action of ordinary coal-gas, an explosive compound of copper and acetylen (one of the many ingredients of coal-gas) is formed. When dry, this compound detonates with extraordinary violence as soon as it is rubbed, struck, or heated. Accidents have occurred, and workmen have lost their lives, while cleaning large copper gaspipes, from this circumstance. No such explosive compound appears to be formed when iron or lead is used. Dr. T. L. Phipson, of Putney, writing to the *Times* recently on this subject, draws renewed attention to the fact that large copper gaspipes are unsafe, and that some other metal should be substituted for the copper, as the latter may give rise to explosions at any moment. As concerns small pipes constructed of this metal, they should not be allowed to get foul; and, when about to be cleaned, hydrochloric acid should be introduced into them for about ten minutes before they are submitted to any heat or friction. Hydrochloric acid decomposes the explosive compound, combines with the copper, and puts the gas acetylen in liberty. The acid may then be washed out with hot water.

The New Cemetery at Witton.—The *Birmingham Journal* gives some particulars as to the formation of this cemetery, which will shortly be consecrated. The chapels are in the Decorated style, with tower and spire, and otherwise similar in design, though varied in detail. The episcopal chapel is 53 feet by 25 feet; waiting room, 32 feet by 15; octagonal reception room, 15 feet diameter. The roof is open-timbered, and the fittings are in pitched pine varnished. The carving was executed by Mr. Meriton, of Nottingham. The entrance to the superintendent's residence is surmounted by a tower with high-pitched roof and four dormer lights. The house has bay windows. The materials of the buildings are Hampstead stone with Bath dressings. The total cost of the works will be about 40,000*l.*; 4,000*l.* of which are for the chapels; 1,200*l.* for the superintendent's residence; 300*l.* for the porter's lodge; 2,500*l.* for the boundary-wall; and 400*l.* for the park paling and holly hedge. The whole of the works, including some stabling, &c., in course of erection, and excluding the chapels, &c., are under the superintendence of Mr. W. S. Till, the borough surveyor. The architect for the chapels, lodges, and gateways is Mr. R. Clark, of Nottingham. The builder employed under him is Mr. Charles Wright, of Nottingham. The clerk of the works in this department is Mr. Beeson. Mr. Cresswell is the contractor for the brick boundary fence; Mr. Newey, of Harborne, for the park paling; Messrs. Sidwell, for the laying out and draining of the grounds; Mr. Chaplin, for the stone steps and balustrades; and Mr. Ashwell, of Coventry, with the assistance of Mr. Till, prepared the plans for laying out and planting the grounds. Messrs. Taylor, of Loughborough, have been employed to found two bells in B flat for the chapels.

Velocipedal Progress.—Mr. Harris, landlord of the Fox and Crane, Bristol, accompanied by his brother, has adopted the novel mode of visiting the International Exhibition on his own velocipede (constructed by Mr. Harris). They arrived in London, a distance of 118 miles, in twenty-one hours and a half; and, after spending three days in the metropolis, the return journey was comfortably performed in eighteen hours.

The Monument to Columbus at Genoa.—The fourth statue belonging to the monument erected at Genoa to the memory of the immortal Genoese pilot, Christopher Columbus, was put in its place on the 24th ult. The inauguration of the monument has been prematurely caused by his ancient and auspicious coadjutor the wind; which appears to have impatiently torn the veil in two that concealed the statue, and cast a part of it, in a most artistic manner, over the arm of the hero.

The New Law on Drinking Fountains.—In the new Metropolis Local Management Act, of the late session, there is a provision to the effect that a vestry or district board may provide and maintain drinking-fountains in such convenient and suitable situations as they may deem proper, and undertake the maintenance of any drinking-fountain already erected, and supply the same with water, and defray the expenses; and any expenses incurred in maintaining any such fountain, or supplying the same with water, are to be paid out of the general rate authorized to be levied. Any person guilty of wilfully fouling the water of a drinking-fountain is to forfeit and pay to the vestry or district board a sum not exceeding 5*l.*, to be recovered in a summary proceeding; and also to pay the expenses of repairing or reinstating any such fountain.

New Law on Highways.—By the new Highway Act, passed in the last session, and which has immediate operation, "highway districts" can be formed by justices in session, and all roads kept in proper repair. A provisional order for the formation of a district can be made, of which public notice is to be given, and objections heard. The justices are authorized either to rescind the order made, or to grant a final order. "Waywardens" are to be elected, and sit at the board with the justices. The highway boards have the appointment of officers; and the district surveyor of a board is every year to make an estimate of the expenses likely to be incurred in maintaining and keeping the roads in proper repair. The expenses of each district board are to be charged on the several parishes forming the district; and payment, when refused by the chuchwardens and overseers, to be enforced against them. The churchwardens are empowered by the new act to levy rates for making payments to the highway boards. In the 47th section of the statute it is shown how a "better management of highways" can be effected in England.

The Middle Level.—The syphons which have been in course of construction for some months past, for discharging the waters of the middle-level drain over the dam, were tried for the first time on Monday afternoon and evening; and, according to the *Times*, so far with complete success. The water had lately been rising to such a height within the dam as to again alarm some of the people of Marshland, and lead them to predict that, if not their own country, certainly that of the middle level itself must be flooded in the ensuing winter. The trial has done something to quiet these apprehensions. Of the fifteen syphons, each 3½ feet in diameter, six only have as yet been laid down; and it was on these the experiment was made. Mr. Hawkshaw, C.E., Mr. Appold, Mr. Harrison, C.E., Mr. Lynn, C.E. (the resident engineer), and other scientific men were present, to conduct and test the operations. The air was exhausted from the tubes by a pump worked by a small steam-engine erected on the bank, and the appearance of water in the pump was the signal to cease working. When the valves at the outer ends of the syphons opened, the water poured over in continuous streams of the full capacity of the outlets; rushing into the outer side of the drain (which now forms a creek from the Ouse) with the noise of a cataract. Of course, the water only continued running during the time when the water level outside was lower than that within the dam—that is, from about half-tide to half-tide; but during this interval so great was the quantity delivered that the level of water within the dam was reduced by 9 inches. This result exceeded the expectations of the engineers; and from it may be drawn a satisfactory opinion as to what will be the efficiency of the syphons when their number has been increased to fifteen, which it is hoped they will be before winter fairly sets in.

Gibson's "Cupid."—The coloured "Cupid" has been sold, it is said, for fifteen hundred pounds.

Post-office Savings Banks.—Notwithstanding the depression of trade and the distressed condition of the manufacturing districts, the Post-office Banks are rapidly attaining a business of enormous magnitude. The acknowledgments for deposits are printed with consecutive numbers; and Mr. Tidd Pratt states that, two months ago, there had been already more than 360,000 deposits. Many post-offices are known to have issued books to more than 500 depositors; several to more than 1,000; and there are above 2,500 Post-office Banks open. Trustees of old savings banks are rapidly determining to transfer their labour and responsibility to the shoulders of the Government.

Plans for County Down Lunatic Asylum. The *Downpatrick Recorder* states that, in accordance with the resolution passed at last assizes—viz., that plans should be advertised for,—the secretary of the grand jury wrote to the proper quarter for information; and, in reply, received a communication from the Board of Control, to the effect that they had no power to sanction the payment of money as a premium for the best plan. The committee had then no alternative but to appoint an architect, whose plans, when ready, will be submitted to the Board of Control for their approval. Mr. Smyth, the county surveyor's plans for the intended asylum, adds our authority, will be ready by the end of November: they will then be submitted to the Board of Control; and, if approved by that body, will subsequently be laid before the Grand Jury at the ensuing assizes.

Public Income and Expenditure.—It appears from a return just issued "of the public income and expenditure in each year ending the 31st of March, 1859, to the 31st of March, 1862," that the total income for the year ending the 31st of March, 1859, was 60,961,315*l.* 3s. 8d., and the total expenditure for the same year 60,147,913*l.* 14s., being an excess of income to the amount of 813,401*l.* 9s. 8d. The total income for the year ending the 31st of March, 1860, was 66,651,120*l.* 13s. 10d.; the expenditure 65,063,741*l.* 0s. 8d.; being an excess of income over expenditure to the amount of 1,587,379*l.* 13s. 2d. The total income for the year ending March 31, 1861, was 65,796,226*l.* 11s. 7d., and the expenditure for the same period, including 50,000*l.* for fortifications, 68,354,611*l.* 3s. 2d.; being an excess of expenditure over income to the amount of 2,558,384*l.* 11s. 7d. The total income for the year ending March 31, 1862, was 64,974,897*l.* 18s. 8d.; and the total expenditure 67,386,904*l.* 2s. 2d., including 970,000*l.* for expenses of fortifications, being an increase of expenditure over income to the amount of 2,412,006*l.* 3s. 6d.

The Accident at the New-street Station, Birmingham.—The inquiry concerning the death of the unfortunate men who were killed on the occasion of the recent distressing accident at the New-street station has been resumed. Two of the workmen employed under Mr. Wood in painting the roof were first examined. One said the scaffolding was not sufficiently strong; and the other spoke to a conversation alleged to have taken place between Mr. Holmes, the contractor for the scaffold, and a number of the workmen, when the former was reported to have said that the job would be his ruin. Mr. J. J. Bateman, architect and surveyor, produced a plan showing the position of the *débris* at the station after the scaffolding fell, and gave evidence at some length relative to the strength of the planks and other supports. He could not say whether the scaffold was strong enough unless he understood the weight it was intended to hold. He calculated, taking the situation of the men on the scaffold as given by the witness Green on a former occasion, that there would be nearly 3½ cwt. on it; and in addition to that there would be 4½ cwt. of planking; making a combined weight of 8 cwt., which was more than the breaking weight; whence he inferred that the strength of the iron rods was not sufficient for the weight imposed upon them. Mr. G. Holmes, the contractor for the scaffold, stated that he erected it on the 4th of August last, for Mr. Bikker, the first contractor for the painting; and that it had been approved by him, as it was subsequently by Mr. Wood, and his foreman, Mr. Gill. There had never been any complaint made to him about the scaffold, and he could only account for the accident on the supposition that a weight was concentrated upon the end of one trussel, which was more than it was able to bear. The inquiry was further adjourned.

New Freestone Quarry near Forres.—Mr. Meakin, in his excavating operations on the Inverness and Perth line of railway, says the *Forres Gazette*, has recently discovered a bed of capital freestone at a cutting on the north side of the Lochnavandoch Park, on the estate of Altyre, about three miles by rail from Forres. There is 8 feet of a face of stone above the level of the railway; and how deep the rock may be is not known. Workmen have reported on the stone as of excellent building quality, although somewhat soft at the surface.

Another Well-sinking Accident.—At Rushhill, near Bath, three men were engaged in sinking a well. The work had been suspended, and resumed. The well was about 55 feet deep. The first to descend was seen to fall out of the bucket. Another descended, and met a similar fate. The man who was at the surface ran off to give information of what had occurred; and during his absence a mason living close by arrived at the well, and was let down by two women, only to meet the same fate. A fourth man was let down, but the precaution was taken of attaching a rope to his waist; and as soon as his head was observed to droop he was drawn up in an insensible state; but the pure air speedily restored him to consciousness. A pumping apparatus was then procured, by means of which (and a very good plan too; for carbonic acid gas flows like water, though invisible) the accumulated foul air was exhausted from the well, and the bodies of the unfortunate men were recovered. Pressing "necessity," in this case, seems to have been "the mother of invention." Perhaps, where a fitting pump can be readily obtained, it is the best means of all for clearing a well of foul air.

TENDERS.

For building a small villa, Harrow-road West, Dorking, for Mr. C. Nunn. Mr. F. J. Dibble, architect:—

Hamblin	£710	0	0
Lynn & Dudley	635	0	0
Inkpen (accepted)	620	0	0

For two houses at Newington, Kent. Mr. F. J. Colwell, architect:—

Manley & Rogers (accepted)	£760	0	0

For alterations and additions to the Tabernacle Chapel Hanley. Mr. R. Scrivener, architect:—

Boothroyd	£352	0	0
Steele	275	0	0
Matthews (accepted)	268	16	0

For additions to South Terriby Rectory, Lincolnshire. Mr. Goddard, architect:—

Otter & Reynolds	£447	10	0
Stamp	300	0	0
J. Dent	299	0	0
Gibson	297	10	0
R. Usher	293	6	1
Johnson (accepted)	278	0	0

For alterations at the Lincoln Grammar School. Mr. Goddard, architect:—

Fox	£365	0	0
Barnes & Birch (accepted)	322	18	0
Catton	320	10	0

For one pair of farm labourers' cottages on the estate of Mr. H. E. Gurney, at Horley. Plans and specifications by Mr. J. F. Matthews. Quantities taken out by each party:—

Barnes	£240	0	0
Holdsworth	272	0	0
Nightingale	338	10	0
Thornton	348	0	0

For rebuilding house No. 32, Little Marylebone-street, for Mr. R. Ford. Mr. J. Worthington, architect:—

Morris	£1,040	0	0
Baggaley	948	0	0
Mennement	880	0	0
Henshaw	880	0	0
Hart	865	0	0
Humphries	798	0	0

For building warehouse at Bethnal-green, for Messrs. Schooling. Mr. C. Gray, architect. Quantities supplied:—

Macey	£2,489	0	0
Clemence	2,483	0	0
Forrest	2,410	0	0
Howard	2,407	0	0
Read & Son	2,381	0	0
Dudley	2,031	0	0
Livermore	1,735	0	0

For new kitchen offices, Moat, Mount Hendon, for Mr. E. W. Cox. Mr. T. H. Vernon, architect:—

Wardle & Baker	£1,200	0	0
Dove Brothers	1,045	0	0
Patman & Fotheringam	1,029	0	0

For new shop-front and repairs to 42, Union-street, for Mr. Benjamin. Messrs. Scurry & Wright, architects:—

Norrish	£590	0	0
Foxley	550	0	0
Roper	530	0	0
Tracey	527	0	0
Sapwell (accepted)	494	0	0

For three villas, Westcombe-park, Blackheath, Kent. Mr. J. Tolley, architect:—

Watts (accepted)	£3,303	0	0

For alterations to mews, Islington. Mr. J. Tolley, architect:—

Williams (accepted)	£236	0	0